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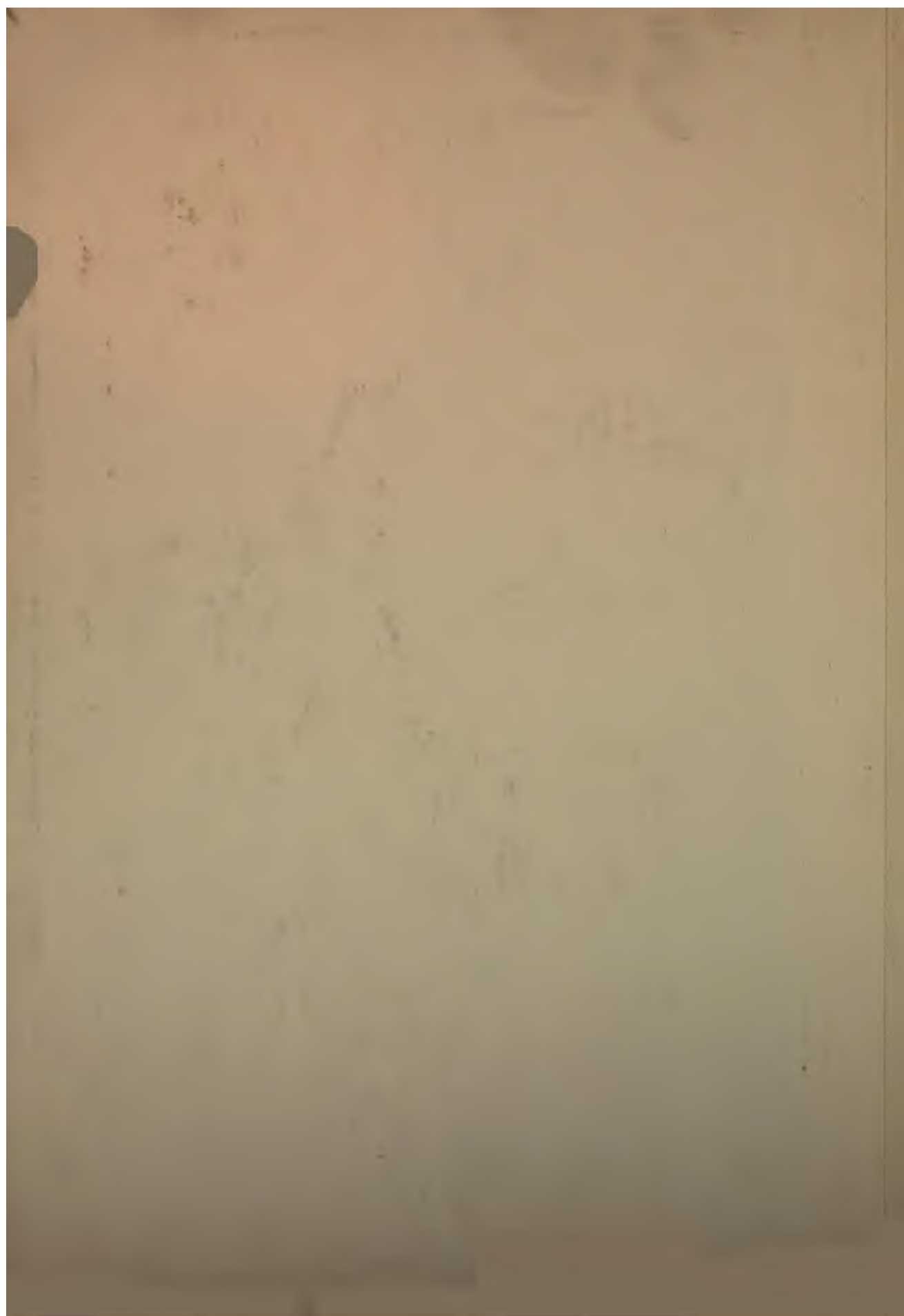
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THE BOOK OF

Lumber Shed Construction

FOR RETAIL LUMBER YARDS, ETC. ALSO LIME
HOUSES, COAL SHEDS, SASH AND DOOR
ROOMS, OFFICES AND SHED AND
YARD CONVENIENCES

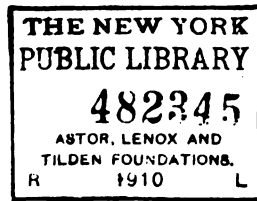
By MET L. SALEY

PRICE, \$1.50

CHICAGO, ILLINOIS
AMERICAN LUMBERMAN

1909 ✓
P.V.W.

(Saley)
VEM



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Among the retail lumbermen there are two distinct classes, the one merging into the other, thus forming numberless gradations. The extremes of one class are working for the accomplishment of several objects primarily for profit, and following profit, among others, for the satisfaction the conduct of their business may be to themselves, and the reputation it may give them with their business acquaintances. As a means to the ends sought these lumbermen are invariably advocates of good sheds. They have learned that such sheds preserve their lumber in a saleable condition, that they advertise their business, that they create the opinion that the owners of them are men of good business methods. Those of the other extreme are lovers of a good showing on the profit side of the ledger, and certainly they are anxious that their reputation as business men should be of the best, but they are neglectful of the means which will accomplish their desires. In mechanics, false principles and crude workmanship never can produce a fine machine, and applying this idea to business affairs, crude methods are never associated with the business men who rank highest.

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Introduction

The design of this work is to promulgate the principles which should be recognized and followed in shed building. A large number of sheds have been visited and each studied with a view to discovering its strong and weak points. There are disappointed shed builders by the hundreds. In some instances they have put thousands of dollars into a shed and then learned that it was deficient in some important respect—in ventilation, foundation, roof, size of the sash and door room, dimension of the bins. Their error was in building without first knowing what would best suit their purpose, and how to build. They were not to the pains or expense of investigating. The writer was consulted regarding the erection of a shed which was to be a duplicate of one located not 50 miles distant from the town of the yard man who proposed to build. The thing for him to have done was to visit the shed resembling that which he was to occupy, adopt its favorable features and reject those which appeared to him unfavorable, yet evidently he did not think he would be repaid for the pains and expense.

It has been the intention to portray the various types of sheds, each of which has its advantages, and any one of which may be modified to meet the requirements of the individual builder. Retail lumbermen have already learned that a shed is a necessity, but many of them have yet to learn that an expensive shed is not necessarily a good one, and that a good shed may be constructed at comparatively small cost.

The time has come when the planning of

sheds should be taken from the hands of the average carpenter, who, while he may be proficient in the art of construction, is ignorant of the principles of ventilation. A building in which lumber may be stored may be wholly inadequate properly to care for the stock; hence a lumber shed should mean more than a structure with four walls and a roof. There are poor sheds by the hundreds which would not have cost a dollar more had they been so arranged as to be convenient and at the same time effective as lumber preservers.

It would be folly to assume that all yard men want the same type of shed. It would be as sensible to assume that they all have a desire to wear the same style of hat. Often it is a matter of former experience; again, irrespective of the taste of the builder, the ground available would compel him to make an arbitrary decision. In every case, however, the principle should first be considered, and the structure, no matter of what type, be made to conform to it.

The sheds illustrated, the plans for which are not printed in connection with them, will serve as an object lesson, as the tastes of dealers vary in regard to the outward appearance of sheds as they do in the architectural designs of residences, and once the correct principles are embodied, outwardly the shed may be constructed to correspond to these tastes. Furthermore, this feature has a news interest, one dealer being pleased to know the general style of the sheds of his collaborators in other sections.

Chapter I

Types of Sheds

The first shed, no doubt, was made by laying boards over other boards which were more valuable, a kind of shed that occasionally is yet seen. This was an improvement on no protection to the lumber, cost comparatively nothing and, as the original generally does, suggested something better.

The next step was the half, open shed, commonly called a single shed, which is the prevailing one. It is less popular than it once was, but the sheds of this type which are erected yearly, if placed end to end, would reach so far that the distance would be a surprise. It is cheaply built, and with a hood—which is a recent innovation—takes fairly good care of the lumber that is piled in it. Without the hood, in time of a storm it is very uncomfortable for man and beast to work around—a condition that evidently many lumbermen are not at the pains to avoid.

The half, open shed, herein shown, still stands as a relic in Independence, Iowa, and is probably the oldest in the state, having been built 44 years ago, 13 years after Iowa was admitted and only two years after the Indians had discouraged the settlers in the northeastern section of the state. The new shed of this type would differ from this one only in matter of minor detail, the general shape remaining the same. The new shed, throughout the middle west, would stand an even chance of being supported on poles, and nine times in ten would have a second deck, the latter, according to the individual building it, being an advantage or otherwise, but oftentimes necessary owing to a want of ground room and the growing necessity, so unpleasantly apparent to many of late years, of keeping larger stocks.

The first inclosed sheds answered their purpose poorly, farther than to shield the lumber from driving rain and snow and to protect the workmen and teams from sun, storm and in-

tense cold—and surely this was much in their favor. No attention was given to the matter of ventilation, as, indeed, there was not in many a so-called modern shed. These pioneer inclosed sheds were very crude in all their appointments, some of the alley doors being hung on hinges instead of rolling to and fro. The cupola was an afterthought, and as now used by eight-tenths of the sheds of the country might as well have remained in embryo.

For years in the leading markets there have been buildings in which seasoned lumber was stored, but the present type of the inclosed shed—so arranged as to cover everything—is not more than 18 years old. Who originated the shed of this character is not known, like many another important invention several claiming the fathership. When the idea was brought to the attention of the yard men at large many of them ran to extremes. There was nothing to guide them, and evidently there were those who thought that the bigger and higher shed they could build the more of a shed they would have—which in one sense was true. One dealer who had ground space and to spare erected a shed that is 49 feet high, with four decks, evidently not thinking that to pile stuff on the fourth deck would require the services of more men than he employs in his yard. Others built sheds which cost respectively, \$8,000, \$9,000, \$10,000, \$12,000, the most of which are woefully deficient in the arrangements which go to make a good shed. To duplicate these sheds no wise retailer would think of doing these days; instead he would build a far superior one for less money. A yard man who 16 years ago built hastily, when the shed fever in his veins was at its height, was heard to remark that if he could afford it he would tear down the shed which cost him \$7,000 and in its place erect one that would continuously save him lumber and labor.

Because injudiciously built probably more than half of the inclosed sheds have proved unsatisfactory. In the results obtained there has been a missing link, and to supply this the double, open shed has sprung into favor with hosts of retailers. It supplies the link, yet it has faults of its own. It takes nearly perfect care of the lumber, but no lumberman would



A SHED OF FOUR DECADES AGO.

argue for a minute that it quite fills the place of the best inclosed shed. That is, no busy lumberman would argue this. The yard man who is busy cannot afford to suspend work because the mercury drops 20 below, or for the reason that his section of country is in the grasp of a severe rain or snow storm. At such times as these he must be piling, sorting, load-

ing, which he cannot do to advantage, uninterrupted, day in and day out, in an open shed, without alley and hood. There are several line yard managers, however, who think so favorably of this type of shed that they are building none other and, acting on the supposition that the men who control a half hundred yards, more or less, have learned their business, individual dealers are fast falling in line.

There are retail men who assert, and very properly, that a yard is not properly equipped unless it have both inclosed and wide, open sheds, the latter for lumber that is not seasoned and the former for material that is so dry that it will not stain or otherwise injure if piled between walls. There are dealers who have built in this way—who have both types of sheds—but of course not all can do so. Incidentally, it may be remarked that if every retail dealer could have his way there would be such an overhauling of sheds as would be possible to exist only in a lively imagination. Probably not one yard man in ten is wholly satisfied with his surroundings in the way of sheds. He has either built a shed with which he is not pleased or bought a yard in which there is a shed that, had he built, would have been of a different type.

The three types mentioned are those which generally prevail. There are others which will be illustrated in the course of this work, several of them plainly modifications or crosses of other types, and others so distinct in their features as to be called types by themselves.

Chapter II

Origin and Advantage of Sheds

To the retail dealers of the east must be given the credit of first having properly cared for their lumber by shedding it. They knew nothing about the shed as it is seen today—that shed being of evolutionary growth—but some of them regarded their stock of sufficient value to be well cared for, and protected it from the elements with a roof.

In the prairie states the shed was slow in coming, one reason being that the lumber trade was in a chaotic condition, sympathizing, as it always does, with the improvements of the country. The farmers as a rule were without ready money, the buildings which went up were of a cheap class, and many of the yard men were so given to granting long credits—the purchaser naming his own time to pay—that with their capital of those days it is a wonder they could keep afloat, to say nothing about indulging in good sheds. Neither at that period was dry lumber appreciated as it is now. Even the modern dry kiln had not put in appearance. The want was lumber rather than dry lumber, and the fact that it was piled where it would catch the rain and snow and absorb the moisture from the ground was not urged as an argument against it. The men who were selling lumber were regarded as handling a coarse product that when stored deserved nothing better than a place in an open lot.

Nearly every office at this time was small, shabby and inconvenient. A box stove in which at times corn and hay were burned, a few cheap chairs, a desk that if it could speak would wonder why it was so called, oftentimes comprised the furniture; and to go well dressed, as the yard man does today, would have been regarded as entirely inappropriate. The old fashioned boots into the tops of which the trousers legs were stuck, a hickory shirt and hands from which a thousand slivers had

been extracted with a jack-knife often, outwardly, is a pen picture of the dispenser of boards of the early days.

Before the shed was known the merchandising of lumber was, indeed, carried on crudely. An old time yard man asserts that for a dozen years or more he did not employ a bookkeeper, and that he knew nothing about bookkeeping himself. His desk was a 20-shilling table, 2x3 feet in size, with one drawer in which were promiscuously kept his stationery, invoices and other documents of a business character. In such extravagances as business cards or printed letter heads he did not indulge. His money depository during the day was a hog's bladder which had been inflated and dried, and dropping his money into this odd receptacle he would twist the open end of it and place it in his pocket. This was of course an extreme, but no extreme these days for uniqueness and crudity could approach it.

When the business began to assume a dignity; when the lumber merchant had reached a conclusion that his calling was as important as that of the man who sold dry goods or groceries, the shed made its appearance; and with the shed came the comfortable office. The lumber office at the present day without its safe would be hard to find. The office with easy chairs, fine desks and couches, heated by furnace or hot water, with pictures upon the walls and carpets upon the floors is by no means rare. In two Texas sheds bath rooms are added to the conveniences.

The prairie states have more fine lumber sheds than any other section of the country; not that the other sections are less alive to the advantage of good sheds but that in these other sections the cheaper and old style sheds were built, and as they are too good to tear away they must serve their purpose until from age they become worthless. In the prairie states

the dealers were not handicapped with sheds of this description. Oftentimes they got along for years with no sheds worthy of the name, and when the shed fever took possession of them they were prepared to go the limit. Structures which cost up to \$5,000 are many; there are those which cost \$10,000 and more; and in Colorado, a state in which an eastern man might not expect to find a modern shed, in one town there are three neither of which cost less than \$20,000, exclusive of the ground on which they were built.

Not all retail lumbermen aspire to own sheds which would rank with the expensive, or even with those which are comfortable and convenient. There are those whose policy it is to put as little money as they can into improvements. Their reasons are:

1—It is not absolutely necessary.

2—In case of a sale the more improvements they have the more they are handicapped.

This in a sense holds true; in another sense it does not. Yard improvements, like all others, cost money, and if a man be so disposed he can look at it in the light that their cost, unless they are absolutely necessary, is dead capital. In the days gone by lumber was sold regardless of such a help as a shed, and so it could be at the present time. By the same token the yard man could use a cheap table for a desk and a hog's bladder for a pocketbook—but not many of them are so inclined. Without doubt it is the ambition of every uptodate lumberman to own a shed if already he does not own one—and there are those who deny that the lumberman is up to date unless this is his ambition.

A dealer reasoned in this way: The interest at 6 per cent on a shed that cost \$2,000 is \$120. A grocer who operates in a small way could not rent a suitable store for less than \$20 a month, which would amount to \$240 a year. Query: Cannot a retail lumberman afford half the rent that a second class grocer can?

The principal advantages which are ascribed to a shed are:

1—It sells lumber, the consumer believing that it is to his interest to buy dry lumber instead of wet.

2—It protects stock, saving a percentage of it which would warp and crack in the rain and sun and thereby become unsalable through depreciation.

3—The inclosed shed adds to the comfort of the men and beasts that are employed in it, protecting them from rain and snow, from excessive summer heat and severe winter cold.

4—The large shed is an advertisement which is seen and commented upon by all who pass and repass. There are owners of such sheds who are of the opinion that as advertisements pure and simple they are worth all they cost.

5—It gives a standing to the lumber trade by virtue of the fact that the yard man has a place of business which for convenience and appearance favorably compares with the stores and shops of his neighbors.

6—There is another advantage which may be summed up in one word—satisfaction.

Dismissing the various phases of the question which might be raised, however, the fact remains that the lumber shed industry is in its infancy. There are sheds by the thousands in contemplation. Were all the yards clear of their present undesirable improvements this would practically be a shed building era, as the number that would go up would be legion.

How best to build? is a question that is asked the writer every week of his life. Many improvements in shed building have recently been made. It is not claimed that the final has been reached, for a sorry day would it be if that were admitted in any line of work, but so well are the best sheds constructed that any yard man may copy from them and as a result own a shed of which he may feel proud.

Chapter III

Location

Any suggestion on this point may be of little value to the many yard men who already own ground, but to those establishing new yards, selling out and relocating, it may be of assistance.

The old way of locating was almost invariably away from the center of town, and nine times in ten on a railroad. It was considered that this was the proper place inasmuch as the commodity handled was heavy, and for the further reason that the yard was unsightly. Oftener than otherwise the piles were not enclosed even with a fence, the lumber stretching along the track—in one instance by actual measurement 40 rods—and how could such a yard be nearer town than it was? It would occupy a block! A scraggy affair of this kind in town would be incongruous in the extreme. One province of a town is to present a neat appearance, and the city fathers would be derelict in their duty to countenance the admission of a business on a principal street that would be an eyesore.

All this time there were dealers, born with the instincts of the merchant, who felt that at this distance from the trading center they were laboring under a disadvantage. The trade that is thrown in the way of a lumber yard by the ladies is no small matter. They select front doors, porch posts, moldings, dictate the style of mill work, and not infrequently buy entire house bills. It was reasonable that these purchasers would appreciate an office that is reached as easily as the other shops and stores from which they order.

The inclosed shed opened the way for the dealer in lumber to take a place as near neighbor of the other tradesmen of the town. Respect must be paid to the laws governing the fire limits; therefore in many cases brick walls and gravel roofs were required and were used. There are sheds which present as fine appear-

ance as do the other business houses alongside of them. The fronts are of pressed brick, the cornice of galvanized iron, the window sills and caps of cut stone, and in a few instances even plate glass has been used. A dealer in Iowa has a show window in a new shed in which are exhibited doors, step ladders, screens, newels, spindles, brackets, as are dress goods and hats in the windows farther up the street.

It is doubtful if the yardman who has a location in the center of the town has ever been heard to regret it. The fact that the yard movement is constantly toward town is sufficient evidence of the wisdom of the change. With, say, two yards in town, one on the edge of it, the other in the business center, nine-tenths of the trade that pays best—the dribble trade—for obvious reasons will go to the latter.

The argument has been urged by the inexperienced that the cost of carting lumber from the railroad to the in-town shed is too great, an argument that those who are doing it gain-say. Dealers in large numbers move their stock on contract from car to shed for 25 cents a thousand, and many are doing it for a less amount. Few yards are so arranged that lumber can be passed directly from car to pile, and once it is loaded on wagon the extra expense depends entirely upon the distance it is to be hauled, the loading and unloading being in all cases a fixed charge.

Other things being equal, the man who locates his yard and shed on high ground will gain in the end. Operators in close proximity to streams have suffered. One large shed was undermined by the water and to prevent it tumbling into the creek was moved. From several sheds it has been necessary to haul the lumber out and redry it. High water has played havoc in yards, upsetting the piles and

carrying much of the lumber down stream. Water cannot be too rigidly excluded from either the yard or shed.

Even when a shed is located on high ground the site of the shed itself should be higher than the surrounding land. A dealer hauled 1,000 loads of sand and gravel on a level plat before a stick of his shed frame was placed, the intention being to grade the lot so high that water could not run under the building. Oftentimes the alley is graded, but this does not answer the purpose. In case of a rain storm,

when there is no snow on the ground, the necessity for grading is less apparent, the water which falls being evenly distributed, but in spring, when snow lies in piles in close proximity to the shed and there comes a rain, or the sun reflected from the shed melts the snow, the water is practically dammed except in one direction, and that direction toward the piles. Ordinarily the importance of proper grading before a shed is built is never so well appreciated as in the spring following a winter of heavy snow.

Chapter IV

When to Build the Enclosed Shed

Deciding that the time to build is when a shed is wanted, or when the yardman is ready to build, has caused many dealers to regret the decision. There is no other time so favorable as when the ground is dry. Sheds have gone up on water soaked ground and for a long time the lumber that was piled in them suffered. A large shed that was built in the winter, when the ground was full of frost, stood for months vacant, it not being thought advisable to pile the lumber in it. The ground on which another stood that was built during a rainy spell was so slow in drying that finally the bins were entirely flooded in an effort—only in part successful—to keep the moisture from the stock. Many a shed collects moisture, and it can be understood how slowly in a

structure of this kind wet ground will become dry. Indeed, it has been claimed that in certain instances it will not become dry. The safe rule is to build during the dryest part of the season and when the frame is once up roof as quickly as possible to shelter the space from any possible shower. A dry atmosphere is a prime requisite in every yard.

When sheds have been built in the winter, in addition to the moisture trouble has been encountered from the heaving and settling of the ground, the foundations being forced out of true. Few yard men will build inclosed sheds in the winter more than once, as the experience will teach them better. The time of building the half open or wide open shed is immaterial.

Chapter V

The Foundation

The knowledge as to what is a proper foundation is so limited, or at least so poorly acted upon, that in every direction there are sheds the lines of which are out of true, due to the weight of the lumber upon the frames. Foundations have been poorly put in for no other reason apparently than that they were for a lumber shed. Lumber being a coarse product the idea must have been entertained that inferior constructive work would answer every purpose. A yard man who built a grain elevator was particular to have the foundation of the most substantial character, but when he built a shed the foundation was slouchingly laid. Another who built a cement house directed that the trench for the wall should be dug deep, and that the wall itself should be heavy and extra well made, but when this same yard man built a shed, the cost of which was four times as much as that of his cement house, the frame stood in line not to exceed six months. There are sheds which cost into the thousands the roofs of which sag in an unsightly manner. A shed that will hold 1,000,000 feet of lumber is carrying a tremendous weight—something like 1,500 tons—and not infrequently this whole weight rests upon the frame. It is on record that jack screws were put under the sills of an expensive shed which was less than two years old, and that, too, after alleged competent authority—a local contractor—had given his verbal guaranty that the foundation would hold all the lumber that could be piled upon it.

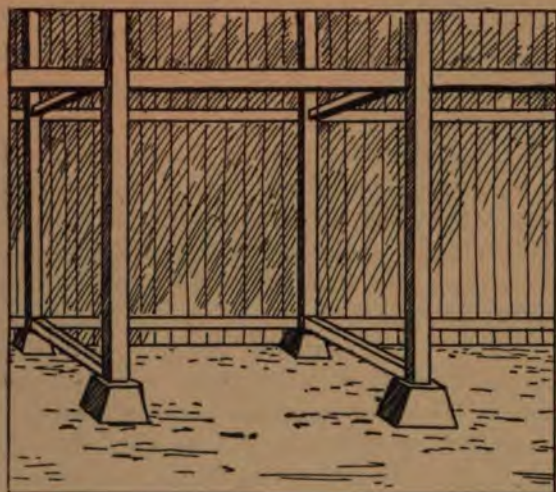
It is of course a self evident fact that the style of frame ordinarily seen in a shed may have a foundation that will hold up any weight it may be required to carry. If the yard man is intent on building as so many others have built before him, his shed will continue to stand plumb provided he uses due care and expense in putting the foundation under it.

There are sheds in which under the entire length of every main sill, and cross sill as well, there is a solid line of brick, or stone work; in others piers of stone or brick every three or four feet—and the timbers supported by these walls and piers will stay in place. The brick in the foundation of one shed cost more than \$500. The foundation of another cost \$700; another \$900; still another to exceed \$1,000; in no case the foundation being on soft or uneven ground.

The majority of shed builders have not learned that often, particularly in the smaller class of sheds, the inside sill running from post to post is superfluous. These sills may be omitted, as may all others which run parallel with them, excepting of course those on the outside. When this construction is followed, and the shed completed, the bin is a clear space, void of any timbers whatever, and with the loose bearings in, is ready for the lumber. Oftener than otherwise these bearings for the piles are timbers laid on the ground; if more space under the lumber is required the timber may rest on piers. As man in general is disposed to do as others have done this form of construction is not often adopted, there being fear that the omission of the cross sill may weaken the frame, yet any carpenter would have to pound his head for a reason why a bent for a shed, with the timbers orthodoxly framed and set, with the exception of the omission of front cross sill, will not stay in place. Should he find this reason it would be rendered invalid by the fact that numberless bents of this character have retained their place. In this case the foundation for the lumber is distinct from that of the shed.

The weight of the lumber on the second deck must also be reckoned with. Rarely, if ever, is it equal to that of the first deck, still at times with a heavy stock the limit of the

strength of its support is more than reached. This weight, however, need not be exerted on the frame of the building, it being shown elsewhere that it may rest upon Mother Earth instead of upon some sill or post which is a



CONCRETE FOUNDATION—CROSS SILL OMITTED.

part of the general framing system. The upper deck should have its own bearings, as does the lower one, and should the plan illustrated on another page fail to meet the special requirements any carpenter can vary it to suit the case.

In any event, load or no load, it is desirable that the posts shall not settle, therefore they should be supported firmly and permanently. Many times brick has been used, but it is doubtful if a small brick pier for this purpose is advisable. Brick has a way of becoming loose and falling from place, and thus brick by brick the foundation disappears. If laid in cement the support is improved, yet the brick itself, unless it is of good quality, will in time crumble away. Stone is an improvement on brick, but for both convenience and looks the stones under the posts adjacent to the alley should be somewhat regular in form. There are at least two sheds the posts of which rest on grindstones obtained after they were well worn down from a manufacturing establish-

ment. To cut stone for these piers would generally be thought too expensive, yet by fastidious shed builders it has been done. Cement comes in as a material that is better than brick, cheaper than cut stone—even cheaper than uncut stone in many sections—and as durable as with reason any building material can be expected to be.

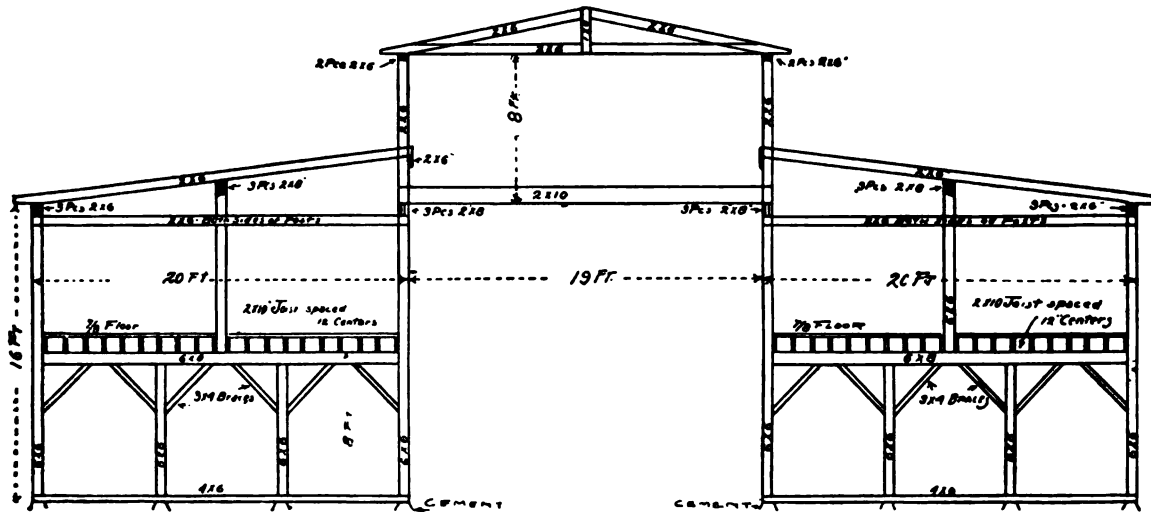
These cement piers may be made the shape of a section of a pyramid, the dimensions, say 20x20 inches at the base, 12x12 inches at the top, and 16 inches high. As the mold is easily made, anybody can turn out the blocks who can mix Portland cement, sand or gravel and water together, the proportion being five parts of sand or gravel to one part of cement, mixed dry, with enough water added to make mortar. Crushed rock can be used if sand or gravel cannot be had. Precaution should be taken that the sand be free of foreign matter, and not too fine. An easy way is to saw common barrels into halves and use these as molds. In order that they may properly mature these blocks should be made at least three weeks before placed under the posts and kept constantly wet. Such blocks for post foundations add materially to the appearance of a shed, and so far as is known to the contrary, will be as enduring as the pyramids of Egypt, which, according to the latest reports, are cement instead of stone.

The requirement is to relieve the frame of weight, a problem that by the use of cement is easily solved and by so doing there is a saving in masonry, with no piers or walls to crumble, or give way and thus cause a sag in the roof of the building.

As nearly all soil on the surface will yield under weight, these blocks should not be set directly on the ground. A hole two and a half or three feet may be dug, filled with concrete, and on this the blocks be placed.

Whatever the style of foundation, it should be made substantial. The flimsy shed support has brought grief to many a retail lumberman. From the ground up they builded well, their sheds are roomy, showy, but they did not take

into account the great weight that was to be supported, and if building again they would pay more heed to the story of the calamity which befell the man who builded on sand.



CROSS SECTION PLAN OF THE KALAMAZOO LUMBER COMPANY'S SHED, KALAMAZOO, MICH.

Chapter VI

Pole Support

The use of the cedar pole has worked a revolution in shed construction. So far as has been learned the pole in this field was first used about 17 years ago—certainly not previous to that date except in isolated cases. It is now used outside the realm of lumber shed building, in the middle west being considerably employed in the building of barns and cattle sheds. A few yard men have pinned their faith to cypress instead of cedar poles, and at much extra expense have brought poles from Louisiana. The economy of this action is questionable; in fact, it is known to be well nigh senseless.

The main object of using cypress, it is claimed, is its extra durability as compared with cedar. Cedar, however, possesses the quality of durability to a satisfactory degree—entirely so when properly set. When poles were first used for sheds no especial care was taken when placing them, simply a hole being dug and the pole set in it. When set in this way for other purposes than sheds they have come out of the ground sound after a lapse of 17 years, with the exception that the sap has decayed. Others were taken out when they had been in 14 years, with no sign of rot. The yard proprietors who have pole sheds which are 17 years old express no anxiety as to their continued durability. In the remote event of decay, however, the poles could be sawed off near the ground and flat stones placed under them for foundations.

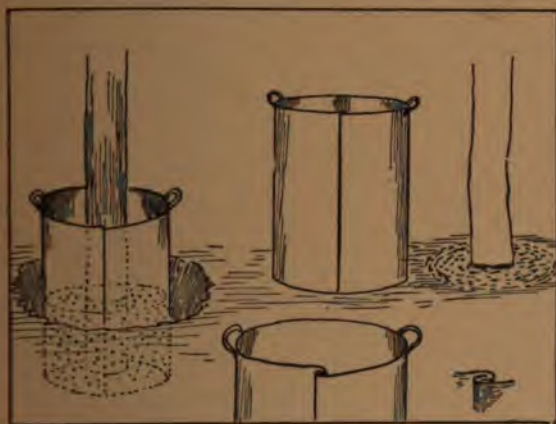
Latterly, the possibility of decay has been anticipated by the more cautious, the pole being set in concrete, which it is thought will preserve it at least during the business career of even the youngest lumberman. This later method of course adds to the expense, though not materially, as a barrel of cement is ample for four or five poles, and by some it is made to go farther than that. It is best that the hole

be dug four or five feet deep, but as the wood does not decay under ground—only on and near the surface—it is not necessary that the concrete exceed two and a half or three feet deep, care being taken that above the surface of the ground it be so packed around the pole, in the form of a little hillock, that any moisture that may come in contact with it shall run away instead of settling around the wood. This is a wise precaution, though ordinarily under the roof there is no good reason why moisture should reach it. By one shed builder it is asserted that the pole should rest entirely in concrete, with three or four inches under it, to prevent moisture from working upward.

When placing the concrete there is an excellent though simple device which works advantageously. This is a sheet iron cylinder, in diameter a foot larger than the pole, three feet long, hinged together somewhat after the fashion of a stovepipe, with two handles attached at opposite sides. First, when the pole is in place the earth is tamped in hard within two and a half feet of the surface, the cylinder is unfastened, placed around the pole, again fastened, and the enclosure is ready for the concrete. Enough cement is placed in the cylinder to fill it several inches; at the same time the earth is tamped solidly around it to the same height. The cylinder is pulled up nearly to the top of the ground and the operation is repeated. This goes on until the hole is filled, when the cylinder is unclashed and removed. The cylinder need not be of heavy iron and any tinner can make it. By this process the concrete is kept apart from the dirt, which is a prime consideration, as in all work dirt mixed with cement is deleterious to its strength.

The great strength of a shed frame of this description admits of no doubt. Shed after shed of the ordinary types has been blown

down, and it is believed that a pole shed will stand a force of wind four times greater than will the common one. When properly braced nothing short of a hurricane will level it. The more poles the stiffer the structure, yet no builder has seen fit to set them thicker than is



CYLINDER FOR PUTTING IN CEMENT.

dictated by the average carpenter. It is also a patent fact that the larger the poles the stiffer the structure, but a 6-inch pole is ample in size, the majority of those used not exceeding five inches in diameter at the small end.

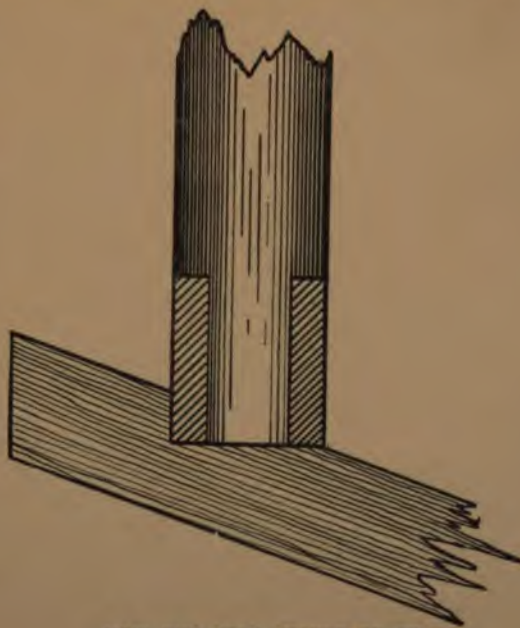
When setting the poles the corner ones should first be placed and the others lined up by them. It is generally, if not always, difficult to secure a large number of straight poles, but if those at the ends be straight it matters little if the others are not entirely so. The chief advantage of a shed of this description is that it is absolutely solid. Perhaps a half of the frame sheds are giving way in some particular, the frame is sinking at some point to an extent that the roof is carried with it, or the bearings which support the lumber have broken. A pole shed can be erected even by a novice in construction, yet all the posts remain as originally placed. Not one carpenter in a dozen, unacquainted with the requirements of a shed, will erect a frame structure that will answer the purpose as well as will a pole shed built by a tyro in the art.

If the second deck be required the poles will

easily support it, though the more conservative builders rest the deck on a foundation of its own. When its weight falls upon the poles not in a single instance is it known that they have settled to an extent to affect the outlines of the roof. To avoid this possibility, however, the independent foundation is advised. When from any cause the roof settles, there is regret that precaution against it was not observed, the expense of such precaution being light when compared with the cost of repair. In every instance the poles along the alleys should be so far in front of the bins as to leave free piling space back of them; otherwise they take the room which might better be filled with lumber.

The treatment of the tops of the poles for the reception of the plate consists in cutting them away, as shown in the illustration, spiking the plates securely to them, one at each side, and trimming them on the upper edge to a slant that will accommodate the pitch of the roof.

Having inspected thousands of sheds and listened to numberless arguments, pro and con, by the best yard men of the country regarding the various styles of structures, the writer



HOW THE POLE SHOULD BE CUT.

is of the opinion that for convenience, cheapness and strength the pole shed is the shed of today. The one objection of importance raised to it is by those yard men who are exceedingly particular as to the appearance of their sheds. To these men the poles are unsightly. It is their desire that when one looks down the alley the ends of the piles and the posts shall be true to line, and this cannot be in the pole shed if it is properly built. This spirit of exact-

ness, while commendable, must be indulged at considerable extra expense over and above what a pole shed would cost that would answer every requirement except the single one of taste, perhaps.

The belief is held by some that the pole figures only in the inclosed, and the wide, open shed, but it is being used to a large extent in the building of the narrow, half open one—in fact, in every type of shed.

Chapter VII

Ventilation

Ventilation has more to do with making an inclosed shed valuable than any other one qualification, for the very plain reason that without it a shed for the storage of the general run of lumber comes near being worthless. Should the shed builder think, however, that he is so to construct his shed that its ventilation will thoroughly do the work required of it—in other words that it will be perfect—he will be disappointed unless he has some plan of his own which others have not tried—a remark that has reference strictly to the inclosed shed. The shed can be built so open as virtually to lose its inclosed nature. A yard man declared that his inclosed shed would take care of lumber right from the saw, provided it was stuck when piled as it would be out of doors. This is the kind of shed that the lumber world has been looking for, and miles were traveled to see it, but the looseness of speech had again deluded. At a distance of a mile or two it surely would have the appearance of an inclosed shed, but its principal claim to being such was that it had four sides. It was entirely covered with 3-inch strips, with the space of an inch between them, and on one end not even a door had been hung. The snow would blow in, as also would driving rain to some extent. In severely cold weather it was little protection for the men and teams, hence to call it an inclosed shed would be in a degree a misnomer.

Certain lumbermen claim they have excellent sheds when really they have never put them to the test, as they fairly dry all lumber outside before it is piled in the bins. A really good shed should take safe care of at least half dry stock.

The ventilation of lumber sheds is as yet an art; it has not yet reached a science. Something, however, has been learned concerning the subject, a few points of which would profit

the inexperienced builder. One of these points is that there can be no egress of air without a corresponding ingress—a principle that is unrecognized by shed builders without number. In the sheds built by these yard men there are cupolas in which there are openings, but no air is admitted to the building except through the alley doors, and these at night are tightly closed. In this latter case, no matter how many openings there may be through the roof the air which fills the shed is a motionless mass.

Another principle is that when a current of air is deflected from its course there is some reason for it—as there is a reason for everything that is deflected. A current of air will not start from one alley door and to please the shed owner leave its natural course, make a circuit around or through the lumber piles on either side of the shed and leave the structure through the cupola, or the other alley door. If it starts from, say, the front alley it is going directly up through the cupola or out the rear alley door, usually the latter, leaving the lumber piles on either side untouched. To be of service it must be directed. But there is shed after shed the construction of which conforms to this erroneous theory. There is no opening in the rear of the piles for the admission of air, the yard man being of the opinion that so long as the alley doors and the windows of the cupola are open the sheds are ventilated. So they are in part—the alley is ventilated, but there is no circulation of air around and through the lumber, precisely where it is most needed.

Many sheds have also been built with no provision for the escape of the air from the roof, the builders holding to the idea that, as the air in the shed is no more rarified than that immediately above it, there is no draft through an opening in the cupola, or ventilator, in the

top of a building. Even in so-called scientific circles not long ago it was held that there was no draft up an upright tube or chimney unless at the foot of it there was first a fire to rarify the air, when of course it would ascend, but recently this idea has been exploded. In this case it is not so easy to tell why there should be a draft when the air outside and inside, top and bottom, is of the same weight, but it exists nevertheless. Fact has established it, and theory must give way.

There is certainly some system, not at present in use, badly needed for sheds of a certain type. The single alley shed, no matter how long it may be, is much more easily ventilated than are those sheds which are more nearly square, with three and four alleys. From the center of some of these large, square sheds it has been found impossible to exhaust the damp air, and in some instances it has been necessary to draw the lumber out and repile it for awhile in open ground. The hose in sheds of this description is an enemy to the lumber, as the ground once damp remains so. There are sheds from the centers of which moisture is never absent. The planked alley in this particular instance makes a strong plea for its value.

By all means air should be admitted in the rear of the piles, and if ventilated as well as

then it should be remembered that an opening for ventilation purposes has no value as such unless it is open. There is very little time in the year when the doors on the sides of the shed, and the windows in the cupola, need to be closed. A blizzard or an extremely cold period might make the closing of them advisable, yet there are yard men who, to prevent any possibility of their sheds being tightly



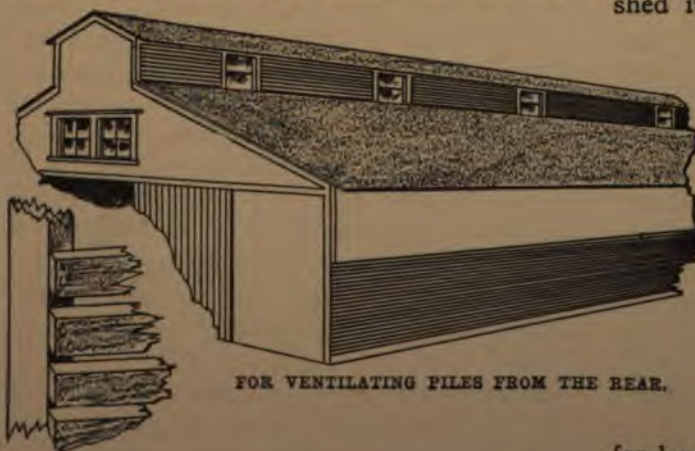
ALLEY SLAT DOORS FOR VENTILATION.

closed, side from four to six feet of the walls in the rear of the piles with beveled flooring, and the sides of the entire length of the cupola with the same material. This makes a fixed circulation, taking the matter entirely out of the hands of the foreman, who might neglect or forget to let in the air by opening windows and doors. In case of doors in the side of the shed it is well to cover the openings with strong wire netting—strong enough

even to turn tramps.

When ventilation is provided for even to turn tramps, with doors and windows a disadvantage is that frequently they do not ventilate, for the reason they are not given a chance to do so. Devices are attached for opening the windows, but so rarely are they brought into service that the spiders spin cobwebs over and around them which remain undisturbed for months and years. Even the doors remain closed

for long periods. It is one of the yard man's chief sins of omission that this part of his duty is neglected. Eighteen inclosed sheds, one after the other, were counted in which it could



FOR VENTILATING PILES FROM THE REAR.

can be done under the circumstances, in the rear of every pile. These openings should have corresponding ones in the cupola—and



UNIQUE VENTILATION SYSTEM OF THE SHED OF THE SCHMIDT & BUNGE LUMBER COMPANY, AVOCA, IOWA. SIX-INCH STRIPS ARE NAILED TO THE SIDE OF THE BUILDING, WITH SIX-INCH SPACES BETWEEN THEM. INSIDE THERE ARE FRAMES FOUR FEET WIDE, ON WHICH THERE ARE NAILED CORRESPONDING SLATS. THESE FRAMES ARE MOVABLE SO THAT BY RAISING THEM SIX INCHES THE VENTILATION IS SHUT OFF, THE SIDE PRESENTING A SOLID APPEARANCE.

not be learned that the windows had ever been opened, and from the appearance of the dust and cobwebs on the inside of the doors the inference was that they, too, had remained closed.

If it is the intention of the shed owner that the windows in the cupola shall admit light only, the object can be more cheaply accomplished. There is in the market a translucent fabric made of a wire cloth imbedded in a waterproof material. It not only admits light but diffuses it. It is proof against hail, being so pliable that it is shipped in rolls. It was used on some of the buildings of the Trans-Mississippi Exposition, at Omaha, on the buildings of the Pan-American Exposition, at Buffalo, and was specified for several of the

buildings of the Louisiana Purchase Exposition held at St. Louis. It gives excellent satisfaction, and the price of it is about half that of glass.

The yard man neglects to attend to this matter of ventilation, and then wonders that his lumber does not keep in better condition. Possibly he condemns the shed, when all the shortcomings are directly chargeable to himself. At closing time the alley doors are shut and for 12 hours the shed is tightly closed. All day Sunday it is closed. In the morning when the place is opened up the air is close and warm. The danger line is reached when in warm weather the air is warmer inside of the shed than it is outside, this being the atmospheric condition that injures lumber. When the condition is reversed—when it is cooler inside than outside—there is less danger. The system of ventilation should be working all the time, nights, week days and Sundays. Every solid alley door should be supplemented by another—this latter made of wooden slats, or large wire, with open meshes, so that the air may sweep through the shed all night. There are shed owners who use these mesh doors



VENTILATING SYSTEM OF THE CRANE-JOHNSON SHED, COOPERSTOWN, N. D. AT THE BOTTOM OF THE WALLS ARE DROP DOORS, FOURTEEN INCHES WIDE, ALSO DOORS OPENING IN THE REAR OF THE PILES. THE FOUNDATIONS FOR THE PILES BEING FOURTEEN INCHES HIGH, THUS PROVIDING FOR A SUPPLY OF AIR BOTH UNDER AND THROUGH THE LUMBER.

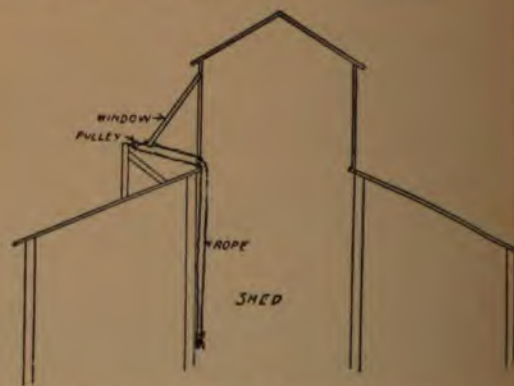


DEVICE NO. 1 FOR RAISING WINDOWS.

almost exclusively. It should be remembered that the cry of the boards which are molding or bluing is for air.

It would not be to the taste of all shed owners to have the windows in the cupola open outward, still several windows have been seen which open in this manner. The device, No. 1, is self explaining; No. 2 is so simple that any one who can bore a straight hole can construct it, the necessary material being cord and

screw eyes. The screw eye is fastened to block, or other support on the roof, and higher this block the wider the window is open. A hole is bored through the window frame, also through the sash. The rope then passed through the frame and screw eye. A knot is tied in it, it is passed through the sash, another knot tied—the two knots hold the sash tightly between them—the ends of the cords hanging so low that they may be reached from the platform, or even from the alley floor. This is a cheap and effective device.



DEVICE NO. 2 FOR RAISING WINDOWS.

Chapter VIII

The Roof

Among the experienced there is but one consensus of opinion, and that is that when the roof of the shed will admit there is nothing will take the place of shingles. Neither is it absolutely necessary that the shingles be of the best brand. The life of a roof made of inferior shingles is longer than many imagine. Indeed, in nearly the whole list of building materials the idea that the best must be used is one to which many cling. For inside the shed that is to be finished in the natural grain of lumber necessary there be no knots or other defects, but where lumber is painted, and exposed to the weather, for both durability and strength the lower grades generally answer every purpose. The old houses when torn down show that the dimensions of the roofing and siding boards were clear and would have been preserved as well had the lumber been of a less expensive quality. There is here and there a builder who is of opinion that paint does not increase the durability of a roof, but in this he is mistaken. It has been settled beyond peradventure that paint adds to the durability of shingles as it does to the durability of siding. A low grade of lumber painted is as durable as a higher grade of unpainted. It is doubtful if it is any but the best policy to leave shingles unpainted. Many sheds are in part shingled and in part covered with other material, the cupola, where the roof has a decided pitch, being shingled, the rest of the shed, which is flatter, covered with ready roofing. A favorite roof for sheds is tar and gravel. This latter roof, however, unless laid by experts, has a way of sagging in spots which at times are difficult to locate and not easy of repair. When ready roofing is used on an inclosed shed care should be taken with the roofing materials. They should be matched and tightly laid and in addition the knots should be tinned

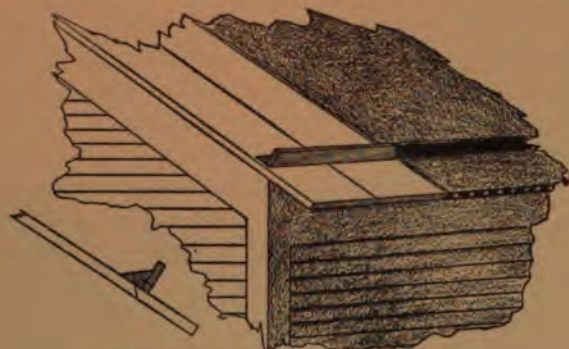
so that in case they fall out, from walking over them, or from other causes, there may be no holes. In the latter event trouble oftentimes ensues, the wind sucking up through, pushing the roofing up and finally tearing holes in it. It has not been learned that there is this trouble with the roofs of wide, open sheds, as the wind instead of playing hide and seek sweeps directly through.

If ready roofing be used it is of decided advantage to lay the strips up and down instead of lengthwise. It should also be remembered that the elements will wear ready roofing as they wear all other material things, and that an occasional coat of paint will add to its lasting qualities. On cheap sheds grooved roofing, battened, will last for years.

Corrugated iron has been used for roofing when fireproof material was necessary for a shed to be permitted within the fire limits; and even when this was not the requirement yard men have used it, thinking it would be durable. In this regard they have generally discovered they were mistaken. No. 28—the number more commonly used—quickly rusts out if not frequently painted, it being a characteristic of a corrugated iron roof that it gathers moisture—and to such an extent will it do this that often it will drip even when it does not rain. Those who have used No. 28 on the roofs of their sheds would not think of using it the second time. It is doubtful if they would consent to use iron the second time, but provided they should it would not be lighter than No. 24, and galvanized at that. Evidently it is to the taste of certain yard men to roof and side with corrugated iron, and a few years' experience has taught them that such iron and the paint pot should be inseparably connected.

The eaves trough belongs with the roof, though perhaps nine times in ten it is conspicuous by its absence. Especially is this observ-

able when a team is loading or unloading at an open shed, the water dripping on horses and men and forming puddles which must be encountered until they shall become dry. Even on the inclosed shed the trough is desirable, as



A USEFUL EAVES TROUGH DEVICE.

it prevents the water from settling alongside the building, a position from which it often runs under the lumber piles. No shed can be called complete without the eaves trough, and on the roof that is covered with ready roofing

it is easily and cheaply formed by running a 2x4 along near the edge of the roof, giving it a sufficient slant to carry the water away, say a quarter of an inch to a foot, and over this piece of dimension drawing the roofing when it is laid. Perhaps an improvement would be to use a 1x4 strip, nailing to the upper side of it a half square. The roofing might be adjusted to this form more readily, as the angle is less sharp. On a long shed it might be well to take the water from the roof midway, as the long distance might carry the upper end of the gutter too far from the edge of the roof. This principle has been used on residences for years, but it is only of recent date that it has been applied to lumber sheds.

Once taken from the roof, care should be taken that the water has no chance to set back under the shed. With an inexpensive trough a foot wide, with six-inch sides, it can be conducted to the gutter or low ground. Where this is done the escape pipe often leads to the sewer.

Chapter IX

The Alley

certain types of sheds the alley is a necessity. Its width is a matter of taste largely, ranging from 14 to 34 feet. The width, however, depends to a large extent on the use to which it is to be put. The yard men who are provided with an alley that will permit two men, one opposite the other, to work in it easily, loading and unloading, use it exclusively for the purposes named. An alley is an alley—a driveway—they say, and not a dump-ound. They term it poor stock keeping ground. They load lumber in front of the bins, necessitating not only a double handling but a blocking of the way when getting stuff piled in the rear. There are yard men who reprimand the foreman who permits a wagon to be placed in the alley, claiming that in every case lumber must go from the wagon to the bin instead of from the wagon to the floor, and thence to the bin. These men are content with an alley, say, 18 or 20 feet in width, and assert there is no advantage in making it wider.

The wide alley advocates claim that in the successful handling of lumber there can be no hard and fast rules observed. If it is necessary to throw off a load of lumber they drop it in front of the bin where it will be stored until it is at their convenience. It must be remembered, however, that in such cases the cost of time is often a long time coming, the lumber accumulating on the alley floor until the piles are strung along the entire length of the alley and on both sides.

Some wide alley timbers are stored in the middle of it, nearly its full length, the drive-ways being on either side of the piles. This is not an afterthought, the alley being built wide for this special purpose.

There is a permanent need of covered drive-ways around a yard. In case of a storm such a place is a refuge for the delivery teams which

may drive hastily in, and not infrequently the farmers who see a black cloud rolling up avail themselves of the shelter. Over night the wagons should be driven under cover; and often lumber is loaded to go out early in the morning which until then should have a roof to protect it from any possible rain, and even from dew. With plenty of ground room there is no good reason why the alley of the inclosed shed should not be ample for all required purposes. Surely the cost would not usually stand in the way, as an extra strip of alley room could be procured at the expense of an extra strip of roof—and of course an extra strip of ground. Perhaps the best evidence in favor of the wide alley is that no shed owner has ever been known to complain that his alley was too wide, while many have been heard to say that if the shed was to be rebuilt the alley would be made wider. It was remarked by a dealer whose shed has a 25 foot driveway that for resorting the space is of great value.

Again, when it comes to the alley floor, there are two opinions as to the material of which it should be constructed. Shall it be of wood or of gravel, or cinders? If durability is the only question involved, then certainly floor the alley with cinders, for such a floor with a little top dressing at long intervals will last a life time. Cinders are also cheaper than wood, as in many places they may be had for the hauling. Time, however, is required for the cinder floor to become hard—probably a year's travel will not more than sufficiently pack it. And at its best wagons move hard on it as compared with the floor that is planked. When it is necessary to move the wagons by hand it will be found that the wood floor has a decided advantage.

One of the big bugbears of the thrifty lumberman is dust, and the presence of the dust that collects in an inclosed shed is why many

a yard man objects to such a shed. They say that the dust swirls through a wide, open shed, while it collects in the one that is inclosed. That it collects in the alley of a shed is a patent fact. The feet of the horses kick it up and it settles on the piles. In many sheds it is regularly swept from the piles, and one dealer is so particular to keep his lumber clean that he goes over it with a broom every time he can see enough dust to sweep. In the alleys in some way it must be subdued, and there are three ways of doing this, namely, with a hose, or by sprinkling the ground with salt, or with oil, the latter to some being objectionable on account of its odor and the ease with which it is tracked into an office. The salt treatment has not proven satisfactory in all cases, for the reason, doubtless, that too little was used. If spread on liberally, and repeated if necessary, it will keep the surface of the ground moist.

The result with either process is the same—moisture, the very element that we wish could at all times be eliminated from the shed. It is moisture that causes the lumber to mold, at times to rot, and deliberately to introduce it into the shed is at least illogical. With the gravel or cinder alley, however, it must be done, provided the yard man is particular as to the appearance of his stock. It is not always done, and as a consequence the lumber from floor to peak is covered with dust. That this condition of the lumber detracts from its selling quality admits of no question. Selling lumber is merchandising, and the man who in any line does not properly care for his goods repudiates a law that is recognized by the most successful dealers in the world of trade.

A slight sprinkling on a plank floor will admit of its being swept without the raising of much dust, especially if it is done often. The best stock keepers sweep their alley floors every day, thereby doing away in large part with their enemy, dust, and in addition keeping their place in such condition that it is sightly

to those who may visit it. The object in using the hose or salt in the dirt alley is to keep damp that the dust will not fly. When a plank floor is sprinkled the amount of water used is so small that it quickly evaporates, leaving the floor dry.

It has been the experience of some of the dealers who have studied the various points that 2-inch cull elm makes the best floor, and in addition to being durable is cheap, costing approximately \$13 a thousand. It is far superior to hemlock, which in many sheds has been known to have holes worn through it in from four to six years. Two-inch maple has been used with fairly satisfactory results.

The laying of the plank floor is a matter that should receive attention. It should be set on a bed of earth or cinders, and this it cannot well be unless it has a bed of earth or cinders for a foundation. To hear an alley floor clatter every time a team is driven over it is unpleasant. There should be timbers three feet apart to which the plank should be nailed, with earth, or cinders, tamped hard between them. To put in a plank floor that shall prove satisfactory must necessarily be an expense, but the alley is an important feature of a shed, and there is no good reason why it should not be treated with due consideration. It certainly has more to do with keeping the lumber in good condition than do some other features which are carefully, even expensively, treated.

As the retail business acquires age in the west, more permanence in the way of improvements is aimed at. To the majority of yard men a gravel or cinder floor is highly unsatisfactory, the plank floor necessarily wears, and to overcome the objections which may be raised to both, cement, in a few instances, has been used, but care should be taken that the work be well done. In one shed the cement cracked and scaled off, leaving it uneven and unsightly.

Chapter X

The Platform

All double deck sheds require a platform, and at times it is built as though it were merely incidental. One platform was measured that was only one foot wide; the boards of another were not even nailed to the timbers on which they rested, and rattled and clattered at every step. Neither of these, however, was typical in any sense. In width the platform usually varies from two to five feet and is of plank nailed solidly to the projecting timbers. Two feet is entirely too narrow for a platform, and four feet none too wide.

Those who have fallen from platforms will assert that there should be no space between the plank, and that the man who nails a strip along the outer edge, as is sometimes done—though for what purpose has never been explained—is innocently making what may prove a death trap. The man at work on the platform is constantly turning and returning, bending and straightening, putting boards upon the pile, which may be higher than his head, or taking them from the pile, and there should be no spaces between the plank, or strips which project above the surface, which are liable to catch the sole of his shoe and trip him.

The platform is the danger point of the shed. There are those who have fallen from it who will carry the effects of their injuries through life. To eliminate this danger a guard rail that is easily and cheaply attached, and that answers the purpose perfectly, is used. In towns especially where the workmen are dominated by union leaders; where suit is liable to be brought against the employer for every injury received by the employee, there are yard men who say they could not afford to be without these guard rails, as their absence might cost them thousands of dollars. Evidently they are of the opinion that should a suit of this character be brought the verdict might be that the

injury was caused by criminal negligence on the part of the proprietor of the premises in not providing a guard rail. If lumber sheds were industrial establishments, subject to inspection by state authority, with little doubt the adoption of the guard rail would be compulsory. The open platform is a menace, and year after year is permitted to remain so.

To have the platform guarded is often appreciated by prospective buyers who would inspect the stock. Not every man can walk with impunity on a narrow way, even though it be not more than 10 or 12 feet from the ground, and when he goes with fear and trembling, his chief desire being that he may leave the place alive, the good quality of the stock may pass unrecognized by him. Cases may be cited where farmers who came to town have called at the yards late in the afternoon—possibly in the edge of the evening—with a disposition to walk even a slack wire were it regarded as desirable to do so, yet with heads so light that they could hardly walk upright with the wide earth as a footing. A farmer when in this condition fell from a platform, but fortunately was only slightly injured.

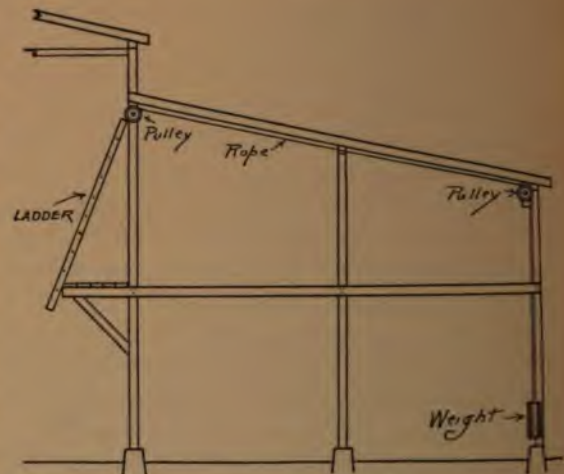
Old or elderly people whose feet are less steady than they once were find it necessary to look at the lumber in the second deck, and not infrequently, and very wisely, they refuse to walk along an unprotected platform. The open platform is dangerous, and as an illustration that familiarity breeds contempt the fact may be stated that it is generally the employee of the yard that falls from it. The visitor is cautious. If he goes upon the platform he goes so carefully that he is sure of his footing, and if he has reason to doubt the steadfastness of his head or feet he does not venture. The employee, however, gets past the point of being on his guard, is careless and either steps or falls off.

The proposition should be accepted by all yard men that every grade and kind of lumber carried should be so stored as to be inspected without endangering the life or limb of the man who is looking for stock. Every yard man would regard this proposition as very reasonable, yet not one dealer in three hundred—probably not one in five hundred—acts upon it.

As an assistance in piling and loading, serving as a fulcrum on which the boards are swung, the yard men who use them aver that these rails are richly worth the money they cost. At first blush it might be thought that they would be in the way, but it is the testimony of the users that they are not. It does not require much ingenuity so to attach the rails to the posts that if desired they may be removed at pleasure.

How to reach the platform is a question that is worthy of consideration. Oftener than otherwise the way is by a ladder, but certain yard men say they would not for a moment think of using a ladder for such a purpose, for the reason that so many object to climbing it. There are old or crippled people who, under ordinary circumstances, would not think of climbing a 16-foot ladder, and when a lady has occasion to go to a platform, which is not often, she seriously objects to the ladder route. Yet there

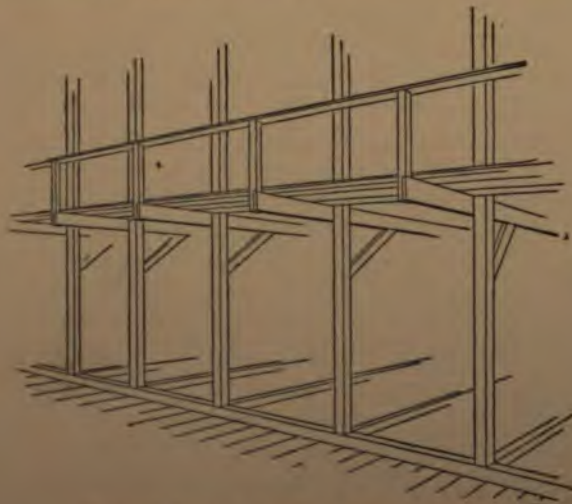
is a pretentious shed, the warehouse of which is over the office, with no way of reaching this warehouse except by a ladder. If ladies inspect the front doors they must either do it from the ground when the salesman exhibits them from the platform, or climb to the room on the ladder.



ADJUSTABLE LADDER, HUNG ON PULLEYS.

Stairs are what are required by the yard man when it is his aim that his shed shall be as convenient in every particular as possible. Stairs as a means of scaling a height are no innovation; everybody goes up stairs at home, consequently no objection can be raised to their use in the shed. Where they shall be located is a question which must be solved by the plan of the shed. By all means permanently if possible. The stairs which are let down when wanted and swung into the air when not in use are cumbersome, and at times lack little of being an abomination. There are times when it is necessary in the interest of a waiting customer to reach the platform quickly, and how can it be done if the effort includes the adjustment of a flight of stairs?

If the way of mounting to the platform is by ladder there must be found some way of disposing of it when not wanted. There may be some quiet little nook where it can rest in peace all the time, but the disposition of a ladder is to be on the move. In a shed, if al-



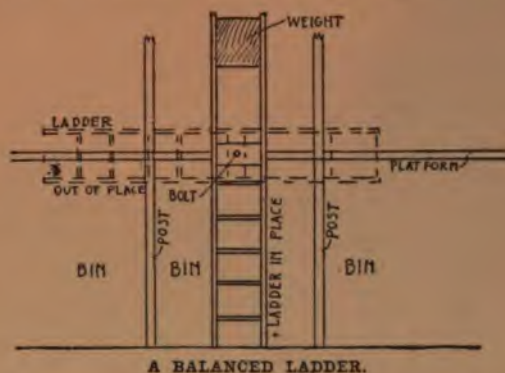
PLAN FOR RAIL OVER A FOOT PLATFORM.

lowed to have its way, it will be here now and elsewhere later on. A trip to the platform implies first finding the ladder. If attached to one end of a cord, to the other end of which hangs a weight, the ladder is at least anchored and can be found. There are several devices for manipulating the ladder so as to keep it out of the way when not wanted, but perhaps none of them is more simple or effective than this.

There are a few shed owners who make good use of a movable bridge that extends from platform to platform over the alley. Iron of sufficient thickness to hold the flanged wheels in place is laid on the platforms, close to the edge, this iron serving as a car track. The frame of the bridge may be of a width to suit the taste of the shed owner—ordinarily about six feet. It is not necessary that the wheels be either large or heavy. This combined movable bridge and platform serves a double purpose: 1—If on the upper decks it is necessary to change the lumber from one bin to another it can be piled on the bridge and run opposite the bin in which it is to be placed. 2—It is handy for crossing from one side of the shed to the other.

The period of bridge building in sheds has not yet arrived in full, there being numberless long sheds in which, if going from the upper deck on one side to a like deck on the other it is necessary to come to the floor, cross the alley and again mount the stairs or ladder. A yard man who desires to do this work as easily as possible remarked that he wanted a bridge every 50 feet of his shed.

To be able to get quickly and handily from the alley or the ground floor to the second story of a shed is a question to which some thought has been given. The devices are several—there are the built-in stairs at the ends of the sheds, and occasionally in the middle of them; the loose ladder which is placed here



and there as wanted and which is generally in the way of somebody; the ladder to which a cord is attached and to the other end of the cord a weight, as illustrated elsewhere, and the accompanying sketch shows a ladder which, so far as has been observed, is peculiar to the sheds of Beatrice, Neb. The ladder is simply balanced, the upper part made to counteract in weight the lower part, or the ladder proper. From the platform extends a pin to which the ladder is hung, this pin passing through both sides of it and secured by a nut. When the ladder is wanted it is pulled down to the floor; when not wanted it is swung up until it is parallel with the platform.

This appliance is used in the shed of the



MOVABLE BRIDGE FOR USE OVER AN ALLEY.

Houston Lumber Company, Colorado Springs, Col. The way was prepared for it by a light track that is laid along the out edge of the platform, on which is run a car for the conveyance of lumber from one part of the alley to another. No doubt, the patented, movable ladders which



A MOVABLE PLATFORM.

are seen in shoe stores and sometimes in hardware stores assisted in giving a suggestion.

It will be observed that the length of the device permits its resting securely against any two posts on the side of the shed on which it is operated. When piling in the upper deck the upper platform of the machine, three feet wide, side to the standing room from which the pil-

ing is done. When loading from the upper deck one doesn't fall so readily from a 6-foot platform as from one half that width. When the upper courses of the piles in the lower deck are to be reached the lower platform of the appliance is used. It was expected to attach a ladder to the platform, in place of the movable one represented.

In a shed, say, 150 or 200 feet long, with stairways at each end, and oftentimes a good deal of walking is necessary to reach the platforms above. G. N. Safford, Rockford, Ill., attaches a pulley to the roof of the shed immediately over the outside edge of the platform, another pulley to a rafter at the side of the shed, runs a cord over, hitches a weight to the



A "HODAG."

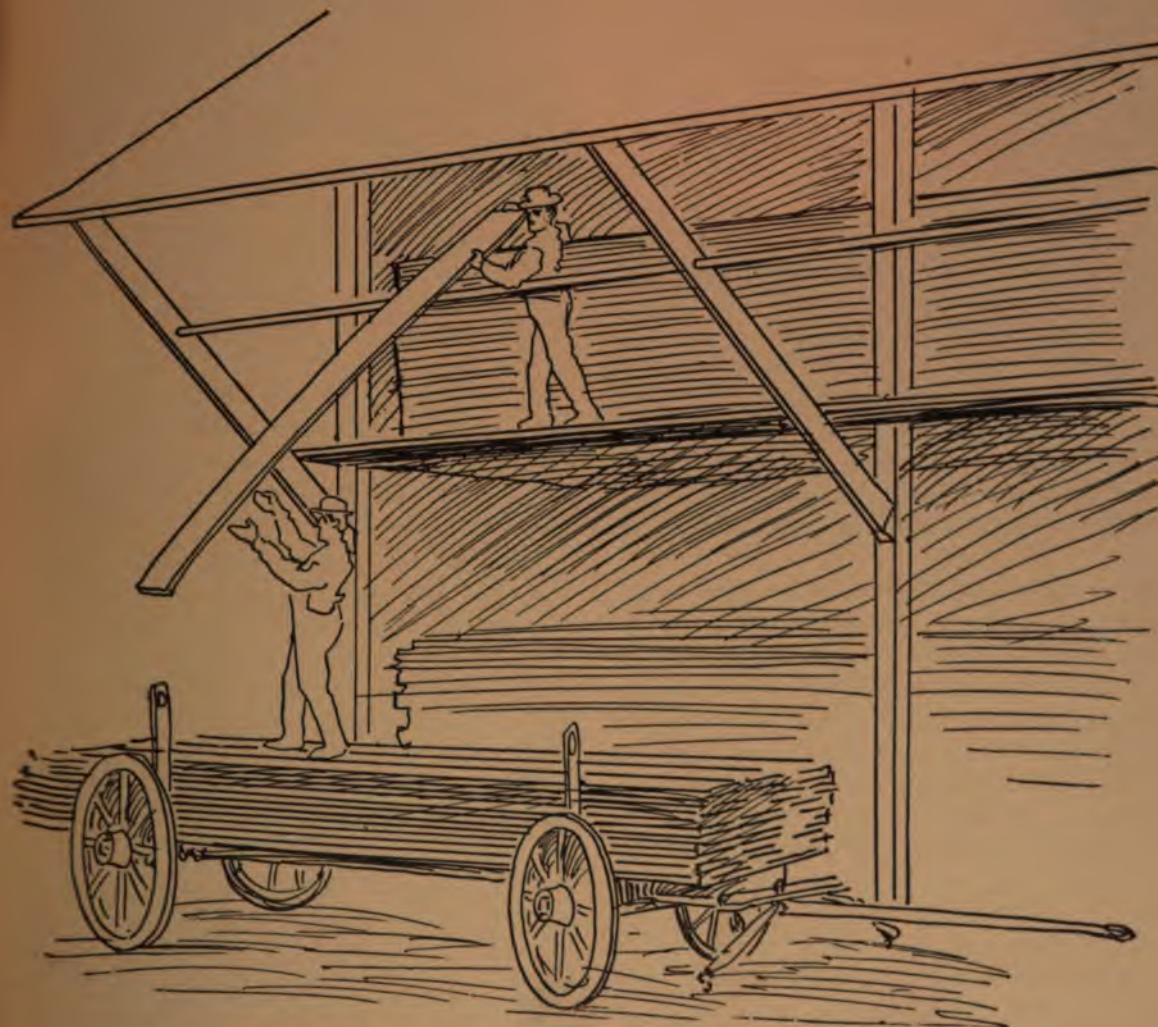


ROOMING LADDER—G. N. SAFFORD'S PATENT.

end of the cord at the side of the shed and a ladder long enough to reach from the alley floor to the platform to the other end of the cord. When not in use the ladder swings in air, the lower end of it resting against the platform. When wanted the lower end of the ladder is grasped and it is pulled to the floor. These ladders can be put in as often as it is convenient to have them.

This "hodag" comes near being a step ladder on wheels, is seen in the shed of the Lane-Moore Lumber Company, Paton, Ia., and is used when filling the bins of the second deck. The wheels are binder truck wheels about 20

inches in diameter, and the axle is 2x4 oak. lighter. From the ground to the platform the distance is five feet, and from wheel to wheel five feet eight inches.



SHOWING THE ADVANTAGE OF THE GUARD RAIL WHEN HANDLING LUMBER OVER IT.

Chapter XI

The Hood

By many dealers the hood is considered indispensable, and perhaps not more than one man could be found in a state who would not say it is a convenience. More hoods, and more hoods, are being built, the rapid change from inclosed sheds to those which are open being the cause. In times past it was not considered necessary to attach a hood to a single shed; in fact, as long ago as the single shed came into being the hood was not in existence. Several of this type of shed that were built thirty and forty years ago have been seen, and not on one of them is there a sign of a hood, the practice being to discontinue the roof at the point when it was past the plate. Few single or double sheds are now built without it, and in many instances it has been attached to sheds which were built at a period that antedates the hood.

It would seem the next door neighbor to uselessness to note the advantages which are derived from a hood, as these advantages certainly are known to all whose sheds are hooded, and from the very nature of the case their absence must be felt by those who use either single or double sheds which are without hoods. To protect the lumber from the hot sun, to prevent the rain or snow from driving upon it, to protect teams and men from standing or working in the sun or storm—surely these are reasons which should make it plain to all that the hood is a necessity. Following a heavy rain, the line under the eaves of a hoodless shed is one of mud and water that may remain for days, and at certain seasons of the year for weeks, while with a hood this line is outside the wagon's width. Without the hood the water and mud splash against the lower courses in the ends of the piles, leaving them unsightly as well as undesirable to those consumers whose desire is for

clean lumber, and this, it must be admitted, practically includes all purchasers.

Not the least advantage of the hood is that it supplies protection for empty wagons over night, or during a storm, as well as for wagons which are loaded in the evening for early morning delivery, thus protecting them from dew and rain. There are yards, the space under the hoods at closing time looking like a store house, sheltering as many as a dozen wagons, some of them loaded and others empty, this space corresponding to the area of the inclosed shed. There are dealers who have built sheds for this express purpose, but the wide hood answers as well. So decided is the value of the hood it may be said that a single or double shed without it is not a complete shed.

The hood that is supported by the rafters of the roof, and shingled as is the roof, should not exceed four feet in width, and if wider than this it should be supported with braces as is shown in illustrations elsewhere. Several ways to lighten the hood have been adopted, one of the most feasible of which is to use roofing boards no farther on the shed than the plate, letting the rafters project as far as the hood is desired to be wide and use for the hood roof light, half-inch stuff. Re-roofing, minus the roofing boards, has been used for this purpose, but it was found unsatisfactory, as it was torn by the wind.

The hood varies from four to twelve feet width, according to the taste of the builder, but if not more than four feet it is generally the wish of the shed owner that it were somewhat wider.

Numerous shed examples illustrated in other portions of this book include the hood in varying styles, with appropriate descriptions in the accompanying matter.

Chapter XII

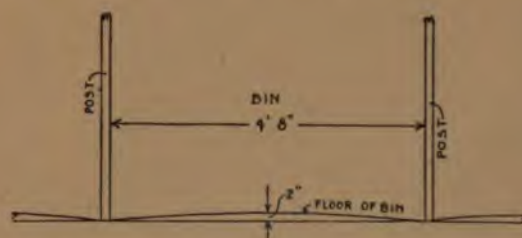
Width of Bin

There are arguments both for and against the narrow bin, but the fact that in the sheds now being built there are perhaps a dozen narrow bins to one wide one would lead to the opinion that the arguments favoring the narrow bin are in the majority. One objection to the narrow bin is that when lumber is run off, as in the case of some, there is too little room for the lumber. There are others who object to the narrow bin, also to the one eight feet wide, and advise by making it five feet. This point should be carried in mind by the shed builder: The bin that is built close to post to post will prove a disappointment. For a so-called 4-foot bin from post to post the width should be at least four feet six inches, for if it is the even four feet the boards will wedge and cause delay in getting the lumber out. The bin should be of a width to allow the lumber to be taken from it freely and quickly, else there is vexation and loss of time. It is the testimony of a yard man who has built bins even feet from post to post that he loses the space that otherwise would accommodate one pile a board wide, rather than have the lumber so tightly packed, with the result of subsequent bother when the time for demolition comes.

It has had much to do with the advent of the narrow bin. A department store must have place for everything—and in its line the lumber yard has become such a store. In one shed 100 apartments were counted, and not one was empty. A yard man counted up over a thousand items which he carried in, and in some way all these items must be stored. It can readily be seen how inadequate a few wide bins—or even all the wide bins—would fill both sides of a large shed and above—would prove in a case like this. The invoice of every yard man of late years has told of greater variety year after

year, and this variety tells the story of the narrow bin. All over the country in the sheds which were built when few bins narrower than eight feet were known these bins are being subdivided. So common is this that a shed built a few years ago can rarely be found in which these subdivisions have not been made. Twenty-three crude partitions were counted in one shed, for the appearance of which the shed owner apologized.

It is not necessary that any hard and fast rule should govern in this matter, however, and it is better there should not. There are items in every stock—common boards and dimension—to which a wide bin is well adapted, while for finish and siding, stock that does not move rapidly or is not kept in large quantity,



CURVED FOUNDATION TO KEEP PILES FROM FALLING.

the narrow bin answers the purpose better. Other things equal, the shed which has both narrow and wide bins is probably the better one.

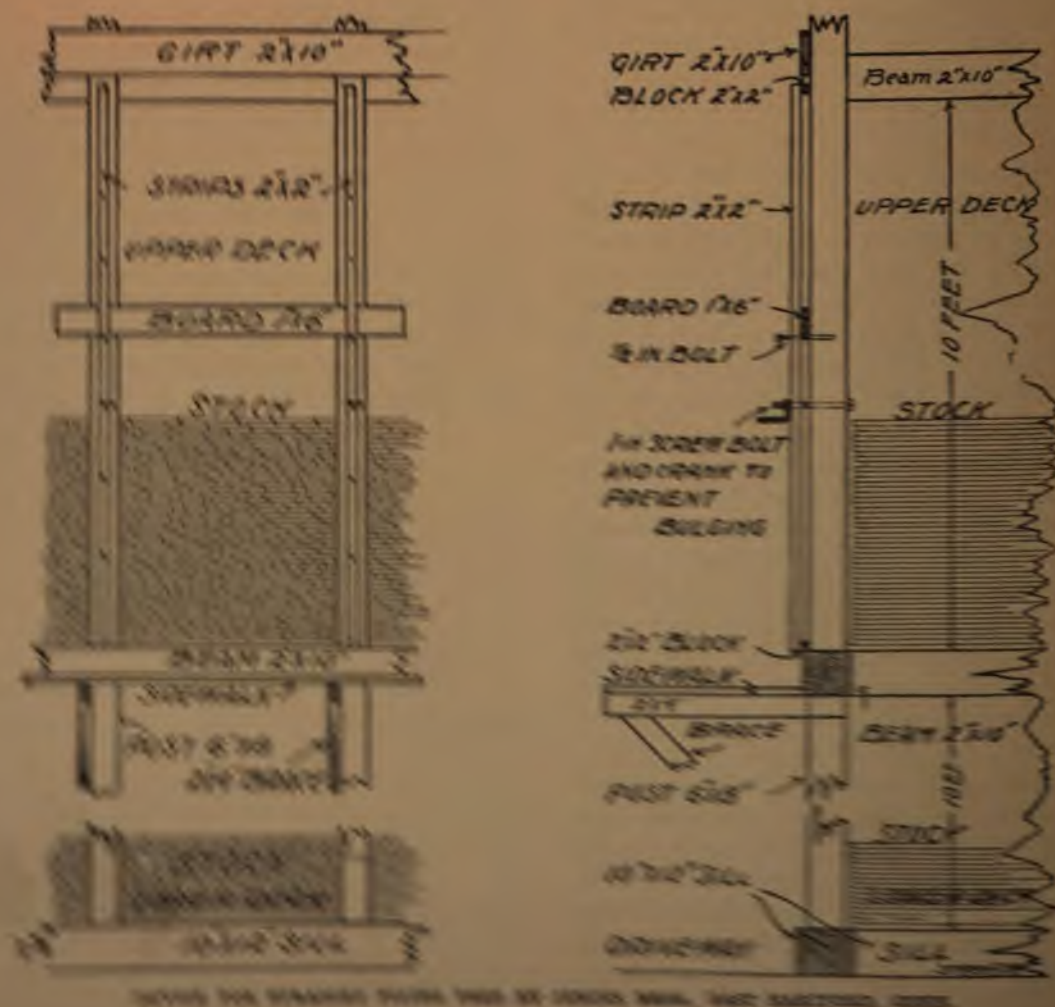
The foundation shown in the accompanying cut is used by the C. Hafer Lumber Company, Council Bluffs, Ia. The object of the curve is to prevent piles from falling toward the center of the bins. Oftentimes there are single piles near the sides of the bins, and if these fall, with the curved formation they go against the posts.

Jencks Bros., of East Hartford, Conn., use the piling scheme illustrated herewith for mak-

ing a neat, even pile and for its help in increasing speed in piling. The whole arrangement is very simple, consisting of a 2x2 strip nailed to each post, with a 2x2 block between the strip and the post to give space for slipping in a wide inch board, the latter being used to "butt" the ends of stock against in piling, thus

securing a uniform face at the end of the pile.

Holes are bored in the upright strip at intervals corresponding with the width of the board used, and iron bolts are inserted to support the board. Another bolt is used to prevent bulging. This one goes through the post and the upright strip and is held by a crank nut.



Chapter XIII

Capacity of Shed

To fit the capacity of a shed to the requirements of a trade is a task rarely accomplished. There are sheds which, to accommodate the lumber at the time of year when the stock is the largest, are inconveniently full, and there are others which are so large as to convey the impression to the casual observer that the yard man carries a very small stock, to the uninitiated it being largely a matter of comparison—the stock with the shed capacity. It is always well for the reputation of the dealer to make as much of a show of his material as possible, for much as certain yard men advocate small stocks, the buying public is never in accord with him in this opinion. Notwithstanding the consumer may be able to obtain whatever he may want from a small stock, he feels that he is better served if it is not small. In this regard it is the same as though a wagon or a suit of clothes were being selected. There is decided difference in the ability of yard men in displaying their lumber, some piling it in such a way that every board will show to advantage, others piling a portion of the bins full and leaving others nearly empty. It has weight when the yard man can assure the purchaser that his stock is full.

There are sheds which are outgrown by the increase of trade, which are certainly an improvement on the appearance of large sheds which are never filled. Nine times in ten the ground space will admit of a shed being enlarged, in such an event all that is necessary being to add more bents. There are builders who side the rear ends of their sheds with this

object in view, so attaching the siding that it can be removed with little difficulty.

Hundreds of yard men are unable to state the capacity of their sheds, never having figured it up, they say. To figure it up, however, is an easy matter. One has only to multiply 168—the number of feet of 14-foot boards in a square foot of front—by the total square feet of frontage, and deduct from the product 25 percent. Thus when a shed is 100 feet long, the lower bin 8 feet high and the upper one 7 feet, the two comprising a bin height of 15 feet, the problem may be solved by this formula: $168 \times 1,500$ (the latter the square feet of bin frontage) = 252,000, and this amount multiplied by 2 (the other side of the shed) = 504,000—25 percent = 378,000 feet as the amount the shed would easily hold, the 25 percent reduction representing the unpiled space in the bins, the room occupied by the posts, and the lath which is used in sticking. This is a safe and conservative way of figuring, as much of the lumber is so dry it is unnecessary to stick it; the planed, and oftener than otherwise the unplanned stuff does not measure an inch; and two feet of half-inch lumber occupies only the space of one foot if an inch thick. In some stocks a 20 percent reduction would make it not far from right, and if the shed is supported on poles, with the bins so deep that the poles do not interfere with the piling, the percentage may safely be made less. Very likely as a rule a shed of the dimensions stated above would accommodate approximately 385,000 feet and permit of comfortable piling.

Chapter XIV

The Warm Room

The object of the warm room is to keep flooring, base and casing dry by preventing them from absorbing moisture. It is a recognized fact that, no matter how dry lumber may be when it comes from the kiln, if exposed to the atmosphere in any except the dry climate of some sections of the west—the result of high altitude—it will absorb moisture to an extent that it will shrink when laid. This shrinkage is a problem that the builder has to confront, and which at times gives him trouble, especially in a high grade of work, few things being more provoking than for a maple or oak floor to show cracks when after a time it has been subjected to the temperature which,

during the colder months, is sustained in all modern residences.

There is no prescribed shape for a warm room of this character, and in reference to heating its location is a matter of convenience. In a shed in Michigan it is simply a large, upright box in which the lumber is stored on end, with a canvas front which answers for a door, and with pipes running into the bottom of it from an adjoining planing mill. An Ohio yard man accomplishes the end sought during the summer, late spring and early fall months by storing his lumber in a close room located directly under the roof. East of the Mississippi, where planing mills are operated in connection with 60 percent of the yards, by a system of pipes the heat may be kept up at no extra expense. In any event, a high temperature is not desirable, simply heat enough being required to prevent the gathering of moisture—probably 70 degrees being sufficient. When hot air, steam or hot water is used for heating the office, which is so often done these days, pipes can easily be laid to the warm room, the one furnace doing all the necessary work. When building a shed the room can easily be planned with this end in view.

The cut shows a primitive warm room which was used in a shed into which a pipe was run from a dry kiln outside. The upright box is 9x9, of sufficient height to take any length of flooring and the temperature kept at about 100 degrees. The door is of canvas. This device has small capacity, but answered its purpose well.

The size of the room will of course be arranged to suit the trade it is to accommodate. The few manufacturers who use rooms of this kind have made them of considerable size, one being 40x200 feet, but ordinarily they hold from a few thousand feet up to a couple of carloads. One yard man remarked that if it were

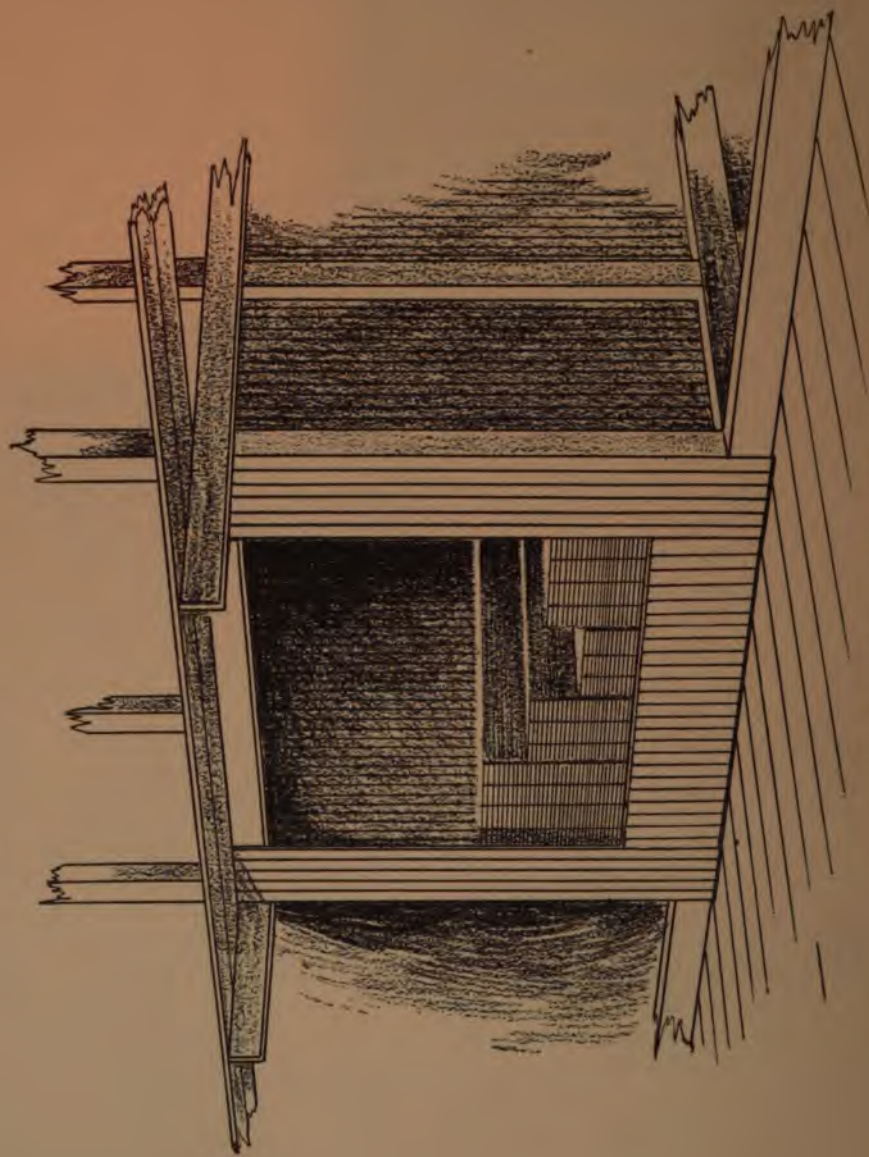


A CHEAP WARM ROOM.

to be done over he would build his room larger, as all the time he is inclined to add to the stock it contains. One shed (illustrated herein) is so planned that a warm room will be made of the entire structure by running steam pipes under all the platforms on which lumber is piled.

The warm room is a comparatively new idea and an exceedingly good one. It is doubtful if any shed adjunct that has been devised is of more value. Its adoption may not be advisable in small towns, but in the larger markets its

worth is unquestioned. It sells lumber, and anything that will do that should be considered. The dealers who use it praise it highly. Being of decided worth, it is a feature that will appeal to any builder. Contractors take to it kindly, and there are yard men who advertise it as one of the chief advantages available to their customers. It can be built and operated at small expense, and the point that will interest the shrewd yard man is that its value is out of all ordinary proportion to its cost.



NOVEL OPEN DUSTPROOF LUMBER ROOM.

Chapter XV

Open Dustproof Room

The idea that dust will not enter a room when the front is open, provided the balance of the walls are absolutely air tight, may at first seem like a piece of sophistry; nevertheless, on the authority of W. H. Teare, of Cleveland, Ohio, who is regarded as one of the most competent of retail men, and also of George S. Gynn, of the same city, who has been a successful yard man, it is not sophistry but a fact.

The requirements are that the bin, or room, be made perfectly tight, with the exception as above noted. There must not be an opening of the size of a pin, else the end sought is not attained. In the construction of one of the Cleveland rooms inch boards were resawed and building paper placed between them. The front of the bin is boarded up about four feet from the bottom, and in this room flooring, casing and other high grades of lumber are kept free from dust.

The novice may ask, What better is this bin to exclude the dust than is any other bin? A brief analysis of the principles involved will answer the question. Two particles of air can no more occupy the same space at the same time than can two tangible objects. A quantity of air cannot gain entrance to a shed unless a like quantity is expelled—a point that was considered in the chapter on ventilation. The

air in these bins forms a cushion which repels the air from the outside when it seeks an entrance, and as air is the medium which conveys dust, if the air stays out the dust is also compelled to stay out. In addition, the bin has the advantage of being open to the weather, yet owing to the closeness of the atmosphere only lumber that is dry, or nearly so, should be stored in it.

This room answers its purpose perfectly, Mr. Teare says. Mr. Gynn's molding room, in which molding is stood on end, is also of this construction, and although there are doors to the room, it is his testimony that he cares little whether the doors are open or closed. The air cushion is the protection from dust. In times of a gale Mr. Gynn has repeatedly watched the openings which serve as doors and could see no dust going in, for the reason that the room was full of air and no more could enter.

It may be well to repeat that the room, above, below and on the three sides, must be absolutely air tight. Approximately so will not answer. Air will pass through the smallest opening, and if this opening exists the air from the outside will come in and bring the dust with it. This idea is presented more as a curiosity than otherwise, the probability being that it will be adopted by few. It has not been seen except in Cleveland.

Chapter XVI

The Store Room

If there is a yard man whose store room for doors, windows, porch columns, brackets etc. is too large he has not made it known. As a rule these rooms are ridiculously small. To say nothing about there being lack of space for display, there is insufficient for the storage of the goods in stock, the passages being so narrow that when it is necessary to bring a sash or door from its hiding place it requires a mariner's compass to steer it clear of the obstructions, with a result that there is often a fracture of temper and sometimes of glass.

When a shed is built the location of the store room is often incidental. It is not originally planned, and any nook or corner that will not answer for piling room is acceptable as a store room. It may be upstairs or downstairs, this end of the shed or that, enclosed or otherwise, no attention being paid to the eternal fitness of things. A yard man who was about to build a shed remarked that he would have a good store room if nothing else; that he had been inconvenienced in this respect more than in any other, and that his old mistakes would now be corrected. If necessary that a portion of his common stock should be piled from under cover it would be done rather than that his store room should be cramped.

The requirements are so varied that no suggestion can be made as to the size of a room of this character, as it depends on the stock carried, this in turn hinging on the location of the dealer. There are dealers who lay in doors and windows by the carload, others whose trade may be as large who order in about as wanted. These latter are within easy reach of sash and door factories, purchasers making their selections from catalogs. Occasionally there is a dealer who does not sell a door or a window—nothing but lumber. Stock sash is not anywhere carried to nearly the extent it was, owing to the fact that for every job of im-

portance—and for many which are inexpensive—the architect specifies odd sizes. Stocks have been seen which did not comprise a quarter of a dozen front doors, the claim being that such doors could more easily be sold from catalogs containing their many styles from which the customer may select. If every yard man builds his store room twice as large as he thinks will accommodate his stock the probability is it will be about right. The aim should be to take advantage of the market, and there should be ample room for the goods which are bought low and which are expected to be held for a time.

On general principles the room should be of a size to admit of the stock being piled around the sides, leaving an open space in the center. It is at times as desirable to show the contents of a store room to a customer as it is the contents of the balance of the shed. There should be plenty of open space in the room in which to exhibit, to talk, to bargain. It cannot be pleasant to ask a man who is buying a bill to stand outside, as the room will not hold two, while some article is obtained from the conglomerated mass within and hauled out. The impression left on the customer is not gilt edged. Unless there is still another room which can be used for the purpose, it is an excellent idea to have the store room so large that a portion of it can be devoted to the storing of the mill portion of a bill which may not have been delivered, and thus save extra handling. There have been cases in which the mixing of one bill with another, or one bill with the unsold stock, has caused confusion and trouble.

The ideal store room is dark, lighted by electricity, or daylight let in by curtains which can easily be raised, the object being to prevent the doors from turning yellow from the sunlight. This, to many, may seem undue caution, but there are dealers who see the neces-



DOORS LAID FLAT, PILED BETWEEN SUPPORTS.

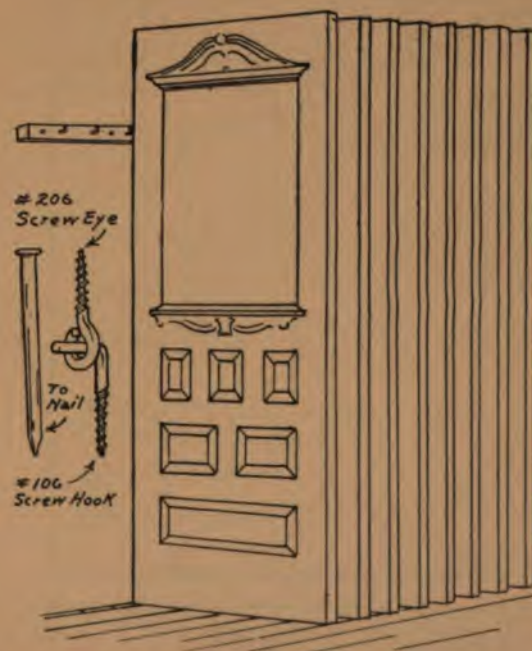
sity of it. When standing in the full light it does not take a pine door long to lose its brightness and take on a yellow tinge. This discoloration does not really injure the door—it will take paint as well as it ever would—but it detracts from the attractiveness of the stock. There are yard men who have many dollars' worth of these doors which are unsalable—at any rate, they have been in stock for years and are yet unsold.

It is hardly necessary to say that these disfigured doors have stood on end, which was plainly the wrong way to store them. Doors should be piled flat, one upon the other, and over the top one may be laid a frame the size of the door, made of lath or other light strips, covered with building paper. This frame excludes the light, catches the dust that otherwise would grind into the door and removes any necessity of having the room dark. There is here and there a yardman who has a tight, dark room for the storage of base, casing and other high grade milled lumber, with a view to keeping it clean and bright.

A plan of a rack in which to pile doors flat

is shown which is highly commended by those who have used it, its valuable feature being its adjustability. If doors are piled on the floor there must be as many piles as there are sizes, else a good deal of lifting of the doors is necessary, and so many piles take room that may be wanted for other purposes. This rack will accommodate an assortment as no other rack will, and it is so simple that any man who can handle a saw and hammer can construct it. In this rack the pieces in which the notches are cut are 2x4, as are also the rails which reach from notch to notch. These 2x4 notched pieces are nailed against a board so that the rails may more readily stay in place. The rack is used in the Disbrow distributing house in Omaha, Neb., and is an excellent appliance. In the making of any rack the rails should be of sufficient strength to prevent the doors from sagging.

The progressive yard man has learned that there is a better way to exhibit his fancy doors than to lift them out and around every time he has occasion to show them to a customer. Several devices have been used for this purpose,



SAMPLE DOORS HUNG FOR EXHIBITION.—ANSON PLAN.

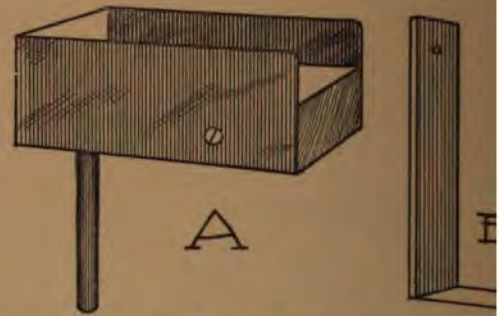
but perhaps for cheapness and effectiveness the one invented by Mark Anson, of Muscatine, Ia., has no superior.

The material with which to hang 18 doors is as follows: Two pieces of 2x4 dimension, six feet long; 18 No. 106 screw hooks; 18 No. 206 screw eyes and 18 10-penny wire fence nails, all of which will cost but a small amount, surely not out of the cents.

The method of construction is very simple: Bore one-quarter inch holes, four inches apart, in one of the 2x4 pieces, and nail it to the floor against the base board. Screw the hooks, four inches apart, into the other piece of 2x4, and nail it to the wall five feet from the floor. Drive one of the 10-penny nails into the bottom stile of the door that is to be hung, one and a quarter inches from the edge; into the edge of the door, five feet one and a half inches from the bottom, put one of the screw eyes; slip the nail into the hole, drop the screw eye over the screw hook, and the door is in place. To release the door it is only necessary to raise it

slightly. There will be enough friction the weight of the doors on the lower piece of 2x4 to prevent them from bumping together as a result of draft.

George Kalbach, of Oskaloosa, Ia., has improved the above device by using a marked A, in place of the nail on the bottom

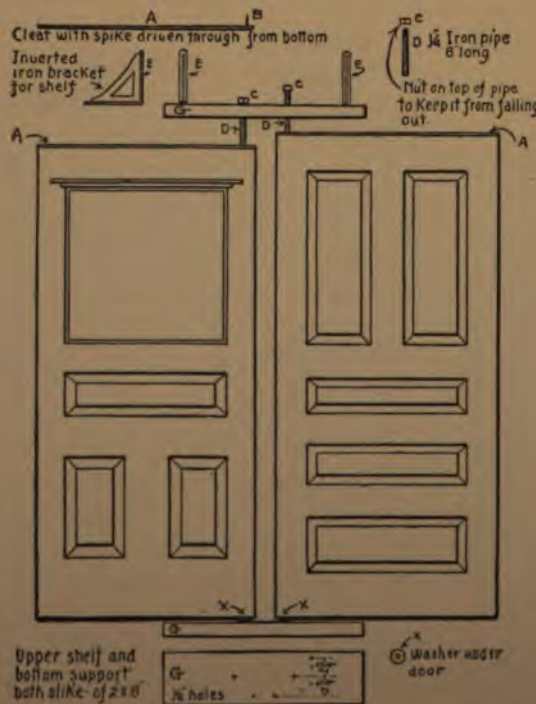


GEORGE KALBACH'S DEVICE FOR HANGING DOORS.
FRONT DOORS.

the door. It is made by bending a piece of hoop iron, two inches wide and nine inches long, around a block an inch and a half square and three and a half inches long, fastening together with two screws, and inserting at the bottom of the block a piece of gas pipe or other iron, half an inch in diameter and nine inches long. Through the piece of dimension at the bottom of the doors holes large enough to admit this pipe are bored, the shoes cast for these, the doors resting on the shoes. The question of getting these shoes cast was considered, but it was thought it would be too expensive. To make twenty-five of them in the manner described cost \$1.

The screw eye which must serve as a support for the door is put a certain distance from the bottom, and to do this accurately and quickly Mr. Kalbach uses a slat, with a piece of tin attached to the bottom of it at a right angle, marked B. The tin is placed under the door, the slat alongside the edge of it, and then a hole in the slat is marked the place in which the screw eye is to be inserted.

Other racks in store rooms for holding files, head blocks and other small articles can be used to advantage.



APPLIANCE FOR DISPLAYING FRONT DOORS.—AFTER BALL.

cut on the preceding page shows the hanging device evolved and used by Ball, of Stuart, Ia., the expense of which is very nominal. The iron pipes serve an unusual end, permitting as they do different lengths of doors to be placed in the same rack. The rack consists of two shelves made of iron, each having six one-half inch holes spaced through in the same relative positions. The shelves are of sufficient length to be easily fastened to the studding, the lower shelf being placed close to the floor and the upper one about seven feet above the lower. A 16 lb nail is driven half its length into the top of the door about an inch from one corner. This nail slips into one of the holes in the

lower shelf, and a washer under the door permits free movement. With two small nails a cleat is fastened to the top of the door, and from the under side of this cleat about an inch from one end is driven a sharp spike which slips into a 6-inch piece of a quarter-inch pipe, and this pipe in turn slips into one of the holes in the upper shelf. A wall space of about seven feet, with shelves made of 2x8, will permit the showing of six doors, and a wider shelf would enable a larger number to be exhibited. The doors may readily be shown on both sides, any door may be removed from the rack without interfering with the others, and doors of different heights may be shown in the same rack without altering any part of it.

Chapter XVII

To Exclude Animals and Birds

Thousands of feet of lumber have been removed in order to get at the carcass of a cat or dog, the stench from which made existence on the premises next to unbearable. In an eastern town a polecat found its way into a shed and took peaceful possession of the alley, but when the man who opens up in the morning sought to depose him there was the usual result. These unpleasant events are comparatively rare, but they are easily guarded against. A score of rabbits were seen scampering along by the side of a shed, dodging under here and there, which might not be objectionable provided that when they die from old age or disease they would take to the open. This they naturally would not do, and it was the testimony of the yard man that at times the air of the sheds had been polluted by what he supposed was dead rabbit. Of course cats, dogs and rabbits can be kept out of a shed if the owner of it so elect. Often there is an open space under the shed entirely around the building, and unless this is closed the shed may be the animals' playground if they so choose. The doors which open in the rear of the piles—if there be such—can be covered with wire, ordinary poultry netting answering every purpose. It is desirable that the air around any business premises be clean and sweet and the lumber yard too often offers strong inducement for conditions the reverse of this.

The English sparrows, which universally are regarded as a pest, make themselves at home in many a shed, chattering in groups, nesting on the timbers, and befouling the lumber over which they visit and hatch. A few of them would cause no comment, but a few hundred are quite another thing. Boys have been hired

to shoot them, but death does not thin their ranks; no sooner is one shot than its double takes its place. The happy thought struck a Wisconsin yard man that he would poison the sparrows which thickly infested his shed. He soaked wheat in arsenic, climbed to the peak of the shed, nailed boards there and on the boards scattered the wheat. Then he took a position in the alley expecting to have revenge. He saw the birds greedily eat the grain and expected to see them fall dead in showers. The poison, however, did not seem to disturb them. They would fill their crops with the poisoned wheat, shake their feathers as with a thrill of joy, fly upon a beam, or on the ground outside, and scrap with their usual vigor. He thought that a sparrow or anything else must finally succumb to such doses of poison as that, and he kept it up, every day for weeks climbing high to scatter the wheat upon the boards. He might have been at it yet had not an Englishman come along and told him that nothing with a gizzard could be poisoned; that years ago England exhausted its ingenuity in an attempt to poison the sparrows, and that not one bird gave up the ghost. It has been asserted that doves will drive away sparrows.

This same yard man is now making another attempt to rid his shed of these little pugilists by covering every nook along the plates and beams with wire fly netting. On the braces he nails narrow strips of this wire cloth and he has got so far as to know that the soles of the birds' feet are too tender to enjoy sitting on the raw edge of the netting. It may be months before the campaign against the birds will be rounded up, but the man who is generaling it is of the opinion that finally it will be made so uncomfortable for them that they will go.

Chapter XVIII

Advertising Space

yard men who believe in advertising large available space on the ends and their sheds, an announcement on which be read by thousands yearly. Occa- to a dealer, his shed is too precious sight to be disfigured, as he calls it, in y. Some of these very men buy adver- space in the newspapers at high rates, rulars broadcast, pay for the insertion names in programs, and even on the which are tacked on the inside of the ed room doors, but the space which is theirs remains a blank. There are ho place huge signs along the comb of ding, yet who would find themselves if ere caught painting one letter on the alls, in this regard holding them as free ontamination from the sign writer's as they do the walls of their houses. value of this space for advertising pur- disregarded by many. Others want it willing to pay for it, and surely if it is to others it must be to the lumbermen ves. It is choice space for the circus atrical managers, and a few sheds, the f which face a street, have been seen ure used as bill boards for this class of lvertising. The proprietor said that the that had recently pitched its tents in n gave him 12 tickets for this 16x150- ace. An Uncle Tom's Cabin troupe corating a part of the wall with blood- and Little Evas, and for this privilege d man was given 8 tickets. With a f pride he said that the posters for the fair would completely cover the wall, it was a home enterprise he made no The patent medicine men and others

who figured in a smaller way than does a cir- cus, an Uncle Tom's Cabin show, or a county fair, regard it as free territory. It must be admitted that this particular yard man is very accommodating. In contradistinction to their habit of giving away a good thing a dealer whose shed is prominently located, with a street running alongside of it, was offered \$150 a year for the space, an offer that was refused. Another, for walls and roof, was offered \$400, and this was also refused. The enterprising yard man does not sell advertising space—he keeps what he has and buys more.

There are ways and ways, however, for the yard man to utilize his walls. It might be well for him to bear in mind that blank space on the side of a shed, as well as in a newspaper column, makes the ad all the more attractive. Those who aim entirely to cover the space with big letters ascertain that the result is flat and unattractive. The letter should not be too large, in form clean cut, of a combination of colors, so they will look alive. One style of lettering, with the letters properly arranged, may be so artistically done that it will continue to delight the eye, while another style in a short time will become obnoxious to the sight. Other business men swing gilt signs over their doors, and why should not the lumbermen? A sign of this description, if not too large and gaudy, gives an appearance of elegance and prosperity.

To attract attention one yard man has painted his shed a bright red, another blue, another yellow. Others paint their sheds a different color every two or three years, and one changes the color every year—all of course for the purpose of advertising.

Chapter XIX

Displaying Goods

Elsewhere in the mercantile world it is regarded as a principle that to display goods assists in selling them, but the custom has not to any great extent found a footing in the lumber trade. Certain dealers here and there are aware that lumber when nicely piled attracts customers. One yard man is so sagacious that in the front of his yard, next to the street, the piles are kept high and even, no matter what the condition of those farther back may be. The great majority of the yard men, however, think that they will sell lumber as a matter of course and put forth little effort to increase their business. When a man wants to build a house or a barn, why, he will come around and buy the lumber for it, for what else could he do? When he wants to build a fence, a fence he must have, and he will come to town for posts and wire. The idea of creating a demand by a display of goods is foreign to them.

One can see a slight change for the better that is being brought about in this regard. So long as the yard men considered that the place for their yards was on the edge of the town on a railroad track there was little opportunity to display goods even if there had been a disposition to have done so. Outside of the little box office and the equally small store room there was no space for a display. But when the dealers moved up town, settled down alongside of the other merchants, saw in the windows of their neighbors an assortment of goods and on the sidewalk another assortment they were inoculated, notwithstanding it "took" only in rare cases.

It would be an injustice to omit to say, however, that there are yard men who are so imbued with the mercantile instinct that they display certain goods systematically. One has a long platform in front of his shed on which this is done. Another has a porch, 50 feet long or more, on which every morning a vari-

ety of goods is paraded. Front doors, screen doors, step ladders, poultry fencing, clothes poles, paint and so on are attractively grouped. It was remarked by one of these dealers that he knew of no reason why his neighbor next door should sell garden implements as a result of exhibiting them and he lose sales of his goods for the reason that he did not exhibit them. It sometimes surprised him, this man said, to see how many farmers when driving into town jump from their wagons and buy some article which, in his opinion, they would not have bought—at any rate not necessarily of him—if the display had not attracted their attention.

The show window in the shed is decidedly an innovation. Goods are occasionally seen arranged in front of the office window, but the show windows—the show windows proper, which were made in which to show things—may be counted on the fingers of one hand, possibly on three-quarters of these fingers. It is time, however, for the yard man to ask, Why is this so? The show window is the rock on which thousands of other merchants than those who sell lumber stand. Obliterate them and they would consider that the trade prop had been knocked from under them. These merchants pay thousands of dollars for these windows, thousands of dollars annually for decorating them, and all for the purpose of appealing to the eye of the prospective customer.

Is it not time that some of the finer methods were applied to the lumber trade? It is susceptible of them. There are opportunities without number if only the yard men will avail themselves of them. It was said by a yard man that he sold a barn bill for \$346 that netted him \$1.25, and the same afternoon an 8-foot step ladder for \$2 that cost him \$1.04, an incident that illustrates that the sale of these extras helps to fill the crevices. Therefore, why not push their sale?

Chapter XX

Molding Racks

Molding, unless due care is taken with it, rapidly deteriorates in value, principally from discoloration due to dust. In case of the sale of a yard no other item of stock is discounted so heavily. In certain sales, before yards were held at a premium as they are at present, the moldings on hand were not invoiced, the purchaser refusing to take them at any price. All told, carloads of moldings have been run through the sticker to restore to them the fresh look they originally had. The bright moldings always sell readiest. Notwithstanding they are to be painted their begrimed appearance detracts from their sale.

With the majority of yard men little pains is taken to keep their moldings clean. They are kept in open racks, often on the ground floor of the shed, and catch all the dust that blows their way. That this is poor business policy goes without saying. It is a law in the mercantile world—a law founded on the taste of the buyer—that shopworn goods to a large degree lose their salable quality, and this law applies to molding as well as to other kinds of merchandise.

Nearly every inclosed molding rack that is seen is new, showing that the yard men are reaching a better understanding of the matter. The dealer who, these days, builds an open rack is in this respect behind the times, paying damage to the old way, which represents waste. One yard man was seen who objected to doors to his rack on the ground that it takes too much time to open and shut them. It takes time to do most things well, yet this dealer is as sensible as are the many who hang doors to their racks and then leave them open from morning until night. If in the morning a piece of molding is wanted the doors are opened and remain so until closing time in the evening. If they are to remain open during either the day or night far better would it be

the night, as during the day the shed is open, the breeze sweeping through and the teams in the alley stirring up the dust. Every employee around a shed should be made to understand that the doors of a molding rack are to be kept closed.

If an open rack should be insisted on the two sides and the end of every pocket should be made absolutely tight—air tight—which will serve to exclude much of the dust. There are numberless racks which are simply frames, the inconvenience attending the use of these being apparent to all, particularly those who have them. When a piece of molding is hastily thrust into the pocket of a rack of this description there is nothing to guide the farther end, and it is liable to find its way into an adjoining apartment.

The way common to a few of marking the



SHOWING HOW EASILY A RACK FOR STORING MOLDING ON END MAY BE CONSTRUCTED.

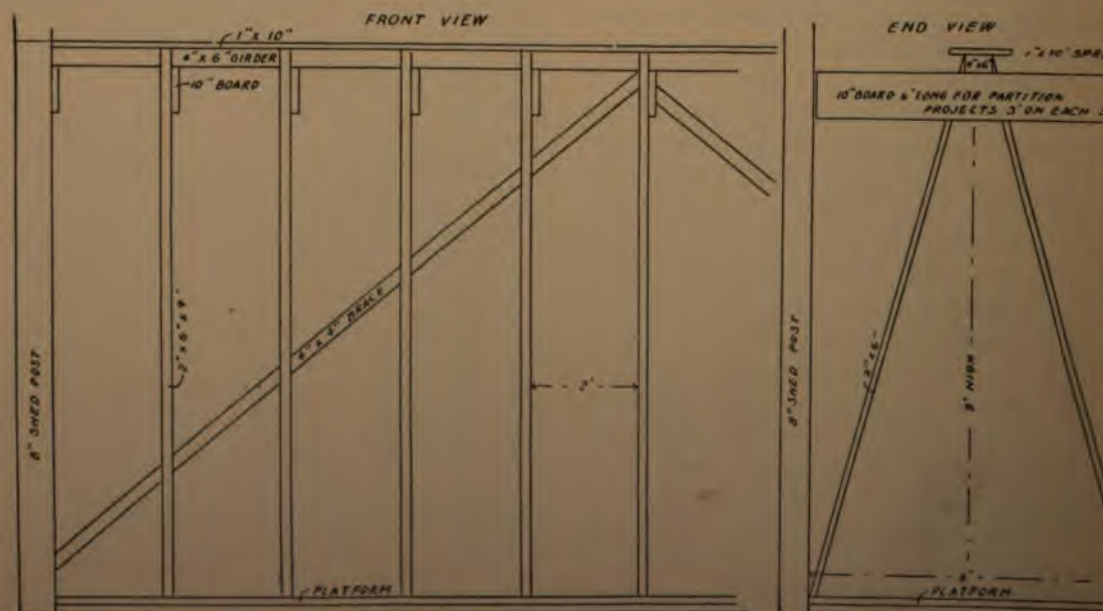
ends of moldings with crayons of various colors to indicate their length is convenient. Thus a molding the end of which is touched with red is 12 feet long; with white, 14 feet; with blue, 16 feet. Other colors may be used for other lengths. A similar system is advantageously employed in marking the ends of lumber in pile so that its length may be quickly determined.

Objections are raised to the comparatively new way of standing molding on end only by those who have not adopted it. That it is the superior way those who have racks of this kind say admits of no doubt. Its advantages are several. When dust settles on it a light tap on the molding will cause it to slide off. It is more easily, quickly and consequently cheaply handled, a dealer asserting that when his molding was cared for in the old way it cost him \$15 to unload a car and pack it in the respective bins; while now the expense is reduced to from \$4.50 to \$5. When a piece is wanted its length can be seen at a glance, thus obviating the pulling of piece after piece from the pockets as oftentimes it is necessary when it is stored in the old time rack. It is well to

remember, however, that although dust is of an enemy to molding when standing or than when lying flat the necessity of tidying inclosing the room in which it is stored exists. The standing rack by all means should be shut off from the dusty alley. In a yard portions of a stock of molding are likely to remain on hand for years and all reasonable effort should be made that it remain as bright as possible.

The molding rack is often on the second deck, or in a room over the office, locally reached only by a flight of stairs or ladder. It will be admitted that in any event, in a double deck shed, there is sufficient running up and down stairs to suit the most active, who would almost seem to warrant that they find a place on the first floor. Such a position will save many steps.

To begin with, the height of the molding room must, of course, accommodate the longest lengths of molding carried in stock. The proper rack may be constructed as follows: Set on end two 2x4s or 2x6s, two feet apart, giving them a slant of, say, one inch to the foot, enough to prevent the molding from falling.



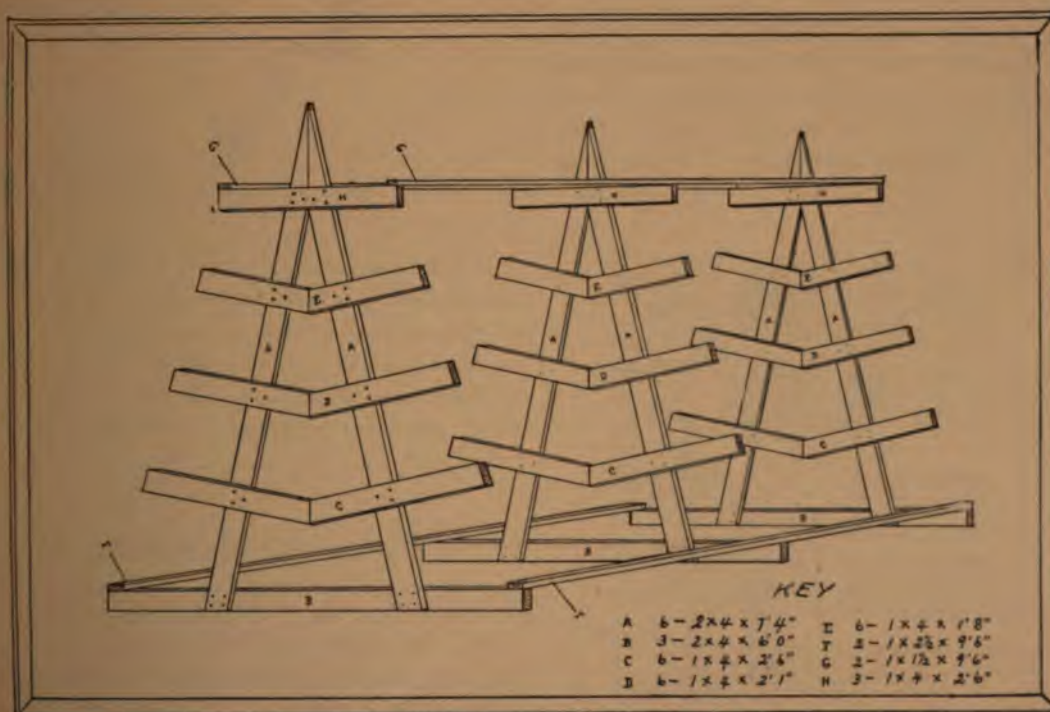
OUTLINE DETAILS OF AN IMPROVED RACK FOR STORING MOLDINGS ON END.

over. On the backs of these pieces of dimension, every three or four feet, nail a strip across, which forms the pocket in which the molding when standing on end rests. This pocket, however, would be liable to be too shallow, and to overcome this defect nail, say, 6-inch strips a foot, or a foot and a half long, on the dimension every four or five feet, these strips pointing toward the front, and then there is a pocket that will hold a good big bundle of molding. Twenty-five, 50, or even 100 pockets may be wanted, and to prepare them it is only necessary to place the pieces of dimension abreast, and nail the strips on the back and front, as already has been done.

In the Knudson-Mercer shed, at Huntington, Ind., is a molding rack that was built by W. B. Cutter, local manager for that company. The rack has 50 pockets, formed by setting 2x4s on end at the required slant with strips against which the molding rests nailed on the back side of them, the space between the two pieces, which are about two feet apart, forming the

pocket, these pockets varying from one to two feet deep, according to the quantity of molding that is desired to be placed in them. Thus every pattern of molding has a place of its own. There are also larger pockets in which are stored bundles of molding from which it is not necessary to sell. On the alley side of these 2x4s is attached a thin strip, painted white, divided into feet and quarters, up to 18 feet, the figures and division lines in black. Also on the edge of the 2x4 is fastened another white strip against which the piece of molding lies when being measured. In less time than it can be told the strip of molding is taken from the pocket and its length ascertained. If pieces of the moldings, say two inches long, were nailed to the 2x4s, thus showing the pattern in that particular pocket, it would round out the nearest perfect molding rack that has been seen.

The accompanying view of a portable molding rack shows the construction used by the Waterloo (Ia.) Lumber Company. It has been



WATERLOO LUMBER COMPANY'S DESIGN FOR PORTABLE MOLDING RACK.



BOX RACK FOR MOLDING.

suggested that it would be handy also for casing and base. It will be seen that the space between as well as outside of the standards may be utilized; and as a farther advantage, the rack is portable.

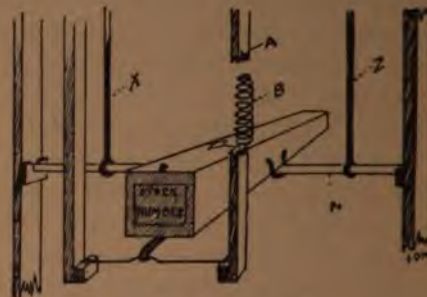
A Box Molding Rack

The accompanying illustration is not presented thinking that it will be adopted by any lumberman who has had experience in handling molding, but that it may be seen what a poor molding rack looks like. If a box



MARKING LENGTH OF MOLDING.

is desired an open bottom, with slats nailed across to hold the sticks is preferable to the solid bottom, as it is less of a dust catcher. The front of it should be inclosed as tightly as possible.



SWINGING MOLDING RACK.

If a box rack is used the following illustration shows how tab can be kept on the length of the strips, simply by marking the length of each on the piece, thus doing away with the necessity of pulling it from the rack before being able to determine the number of feet it contains.

A Swinging Molding Rack

This rack, used in a Wisconsin shed, is illustrated here more as a curiosity than otherwise, as it is highly improbable that it will be adopted by any one.

Cut No. 1 in the accompanying drawing

shows the box up or in place; X and Z are iron bars which support the iron crossbar in case several boxes are attached to it. At A the post is cut away to show the coiled spring B which is attached to a beam overhead and which draws the box back to place after it has been in use. In size this box is 16 feet long, 14 inches wide and 14 inches high, with a door in the front or lower end $2\frac{1}{2}$ feet long. This

box (or any number of them for that matter) is supported overhead in the shed above the driveway or anywhere that may be convenient. The front end of each box is numbered with the style of molding it contains, and when it is desired to show any of the stock all that is necessary is to take a stick with a hook on the end and pull the proper box down as indicated in No. 2.

Chapter XXI

The Office

As in all things else, there are various tastes when it comes to the arrangement of the office. A small room will answer the requirements of some, while others desire it to be of a size in which the carpenters and contractors may hold court when building is dull, these latter believing that it is to their advantage to furnish a sitting place during the winter days for the men who are prominent factors in buying lumber and often for suggesting to those by whom they are employed where material may be purchased to advantage. These same people court the presence of farmers, frequently furnishing them with pipes when they drop in, and through such associations learning of prospective building enterprises. A yard man asserts that by so doing he has sold at least a dozen house and barn bills which he attributes solely to the fact that he employed means to induce the farmers at odd spells to visit his place.

While the private office is considered a necessity by some there are others who will countenance nothing in this shape of a private nature, claiming that its tendency is to estrange those people who like to meet a

dealer on common ground. So particular are certain dealers in this respect that they locate their desks in the front room, so situated that they may easily speak to anyone who may enter. They may have a rear room for the



MIDGET OFFICE AT KALAMAZOO.

bookkeeper, but in front, they say, is the place for them. To treat their customers familiarly is a part of their business policy. And, indeed, it is desirable that the bookkeeper should be so located that he will not be interrupted, the passing of the time of day and the telling and listening to stories being responsible for many errors.

In some sheds the wareroom is across the alley from the office. This must be regarded as a mistake. On general principles the former should be easily reached from the latter—if adjoining, so much the better. Ladies often make selections of front doors, porch columns, head blocks and spindles, and the arrangement should be such that this may be conveniently done.

Above all, the rear office window should overlook the shed, which may easily be done provided the shed has but one alley. When it

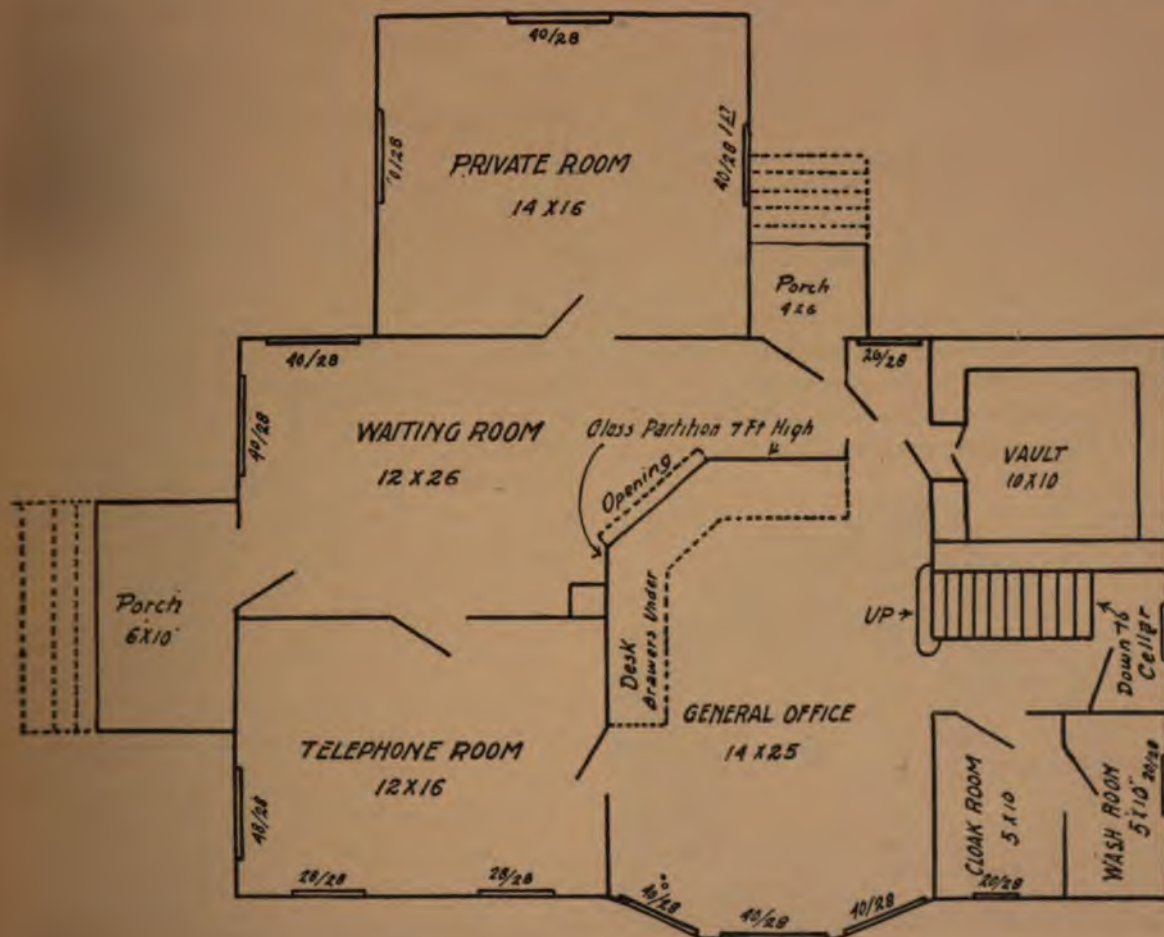


SHACK IN A CHICAGO YARD.

has two the bins directly in front of the office window are sometimes left empty so that the view may be unobstructed. In a two alley shed it is an excellent idea to locate the office between them. To see everyone who goes into the shed and goes out of it has been the means of placing on the books many an item which otherwise would not have been charged. A minute made of the material that is taken out, and by whom taken, will often refresh the foreman's memory when he looks over the record, which he should do every night. A lapse on the part of the foreman is neither unusual nor unnatural. He may have two or three customers on hand, at the same time loading that number of teams, and the tally

kept at the window may detect discrepancies. In the most conveniently constructed sheds the alley window of the office projects—being of the bay variety—thus insuring a full view of the shed. When the side of the building is flat an ingenious way to accomplish the same result is to fasten to a post just outside the window a mirror, say 1x2 feet in size, at an angle that will reflect the alley; thus from his desk inside, whenever the yard man may have a desire to do so, he may watch the movement of business and men.

The porch over the front door is highly regarded by some for both appearance and comfort. One porch is so constructed as to exhibit the porch material sold, but it must be admit-



OFFICE PLAN OF THE HELLER BROS. COMPANY, YOUNGSTOWN, OHIO.

minutiveness there are offices by the hundreds, perhaps by the thousands, which are ample in size and both finely finished and furnished.

The office illustrated herewith is in the yard of Wackenbarth & Blamer, Independence, Ia.

It is 12x16 feet, and the door opens outward. It was built fifty years ago by Z. Stout, who sold enough lumber in it to make a fortune and retire. In its day it was called the "crack" office in Iowa.



UNIQUE OFFICE OF DUFONT B. LYON, PARIS, TEXAS.

Chapter XXII

Storing Timbers

It is generally conceded that in the retail yard timbers are at times neglected. In fact there are few items on the yard man's list which are so badly handled. Timbers to be of the greatest value to the builders must be free from warp; neither is it in their favor when badly checked, and when lying uncovered they acquire both these defects. Many a yard man has sawed long timbers in two because they were so warped that intact they could not be used. Not many years ago it was considered of no great advantage to protect any lumber save the high grades, such as finish, and mill work, or such as flooring, casing and base, by carrying it under cover. In fact the yard man who aimed to protect his stock so as to enable him to pass it out to the consumer in good condition was laughed at by his less enterprising competitors. That day, however, has passed, and so general has it become to care properly for stock by sheltering it from storm and sun that the dealer who does not do it must see go to others trade which otherwise might have come to him. Fewer, these days, shelter timbers than other stock. Yard men who carry all their boards, even all their dimension, under roof permit their timbers to lie outside in the sun and rain, in some cases not even with proper bearings under them. Timbers are seen which have lain in this way so long that decay has set in. Some cover timbers with boards while others make ample provision for carrying them in a way that preserves their true lines no matter how long they may remain unsold.

Different ways of shedding timbers have their advocates, as have different types of sheds. In some elaborate and expensive sheds pockets have been built into which timbers are thrust endwise, and instances are known where these pockets are so circumscribed that in order to get a long, heavy timber from its berth

it was necessary to hitch a team to the end of it and drag it out. Whatever else may be said of it this is certainly an inconvenient process. But because it is a timber—because it is an item that is not sold every day—there are dealers who apparently are of the opinion that it is not out of the way to be obliged to press the whole yard force into service when it is wanted. If the other stock were handled with this same inconvenience the delivery of lumber would be slow and expensive work indeed.

Certain yard men aver that the easiest way to load a stick of timber is to drive the wagon to the end of it and shove it on over rollers, while certain other dealers are as firmly of opinion that the wagon should be driven alongside of the stick. The latter method is growing in favor to such an extent that where new provisions are made for storing, the "broadside" method, as it would be proper to call it—the timber so stored that the wagon goes alongside of it—is employed three times for once for the pocket into which the stick must be pushed when taken in and from which it must be pulled when delivered.

This may be said in favor of the broadside method—the protecting shed often may be cheaply constructed. All that is necessary is a lean-to hood which may be attached to the side of the shed, or it may even be placed against the fence when the latter is tight and tall enough. An illustration in this series shows a shed that is joined to the side of a barn, and it answers the purpose excellently. In many cases mistakes are made by having the bearings too far apart, thus giving the sticks a chance to sag and consequently warp. The experienced teamster has learned that, when hauling timbers of different lengths, for convenience in unloading the longest sticks should be placed on top. So far as known only two yard men, to save the strength of their helpers,

illed themselves of the assistance of
le in loading.

id that the camera never lies, and in
that a lie is a wilful act it does not,
ork is at times deceptive. To look
otograph of this timber shed one
nk that the original did not answer
urpose for which it was constructed,
se of which, however, is true. The
f the camera was such that the shed
pppearance of being higher and nar-
n it really is.

xample is presented to show how
timber shed may be provided. An-
ture desired to be illustrated is that
man, once having his timber stored
shed of this description, may load it
or endwise as he may feel disposed.
e yard forces which are divided in

this regard, one or more of them hanging for
the old way of shoving a stick endwise on the
wagon, while the others may choose to drive
alongside of it, and with this arrangement they
can take their choice without the necessity of
paying their money. This shed is 48 feet long
and is in the yard of M. H. Hand, Plymouth,
Wis. Of course it can be modified to fit the
ground or to suit the taste of the individual
who may copy the idea—made longer, shorter,
wider or narrower. The following is the bill
of material:

24 2-6—12 rafters.
24 2-4— 8 braces.
3 2-6—16 on side lumber shed.
3 1-2—16 on side lumber shed.
74 feet, lineal, 1 x 4 S1S, fascia.
600 feet No. 3 hemlock boards, for roof.
5,500 shingles, 4 inches to the weather.



M. H. HAND'S TIMBER SHED AT PLYMOUTH, WIS.

Chapter XXIII

How to Build A Lime House

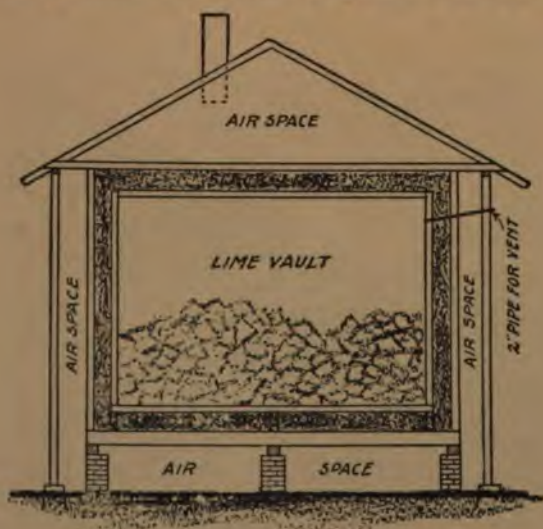
The country is literally full of poor lime houses, a large amount of lime going to waste yearly, in this regard simply responding to the laws of its nature, the yard men being at fault in their efforts to preserve it. When bulk lime is stored in rooms which really are no better than open sheds, the air coming in around the doors and windows, and often through the walls and floors, it will surely slack—and this is descriptive of a typical storage place for lime that is used by thousands. So poorly have many succeeded in preserving lime in bulk that

answer as well, but the yard man who sells bulk lime and has not on hand enough that is slacked to fill the required space will in all probability have no desire to build a lime house.

Around the box or vault is built the house, leaving an air space of six inches between the vault and the walls of the building. On the top of the building will be seen a ventilator, but it is hoped no one will think that its mission is to exhaust the air from the lime vault, as that would undo all that has been done in the way of building tight walls. The object of this ventilator is to create a current of air around the vault and, to secure this current, air must be admitted at the bottom.

In some houses a pipe an inch and a half in diameter—represented by a black line in the diagram—extends from the vault through the walls, its object being to let off the gases. In case it serves this purpose it should be so constructed that it will close automatically. There are handlers of lime, however, who have not discovered that this vent pipe is a necessity.

The door should be made with care. Carpenters often exercise all the skill they possess in building the wall as tightly as possible, and then put in doors around which the air can enter as though they were sieves. The smaller the door the smaller the volume of air which will come in contact with the lime when it is opened. A door 2x2 feet is large enough, as through a door of this size with a long handled shovel every part of the vault can be reached. For durability the floor should be of hardwood—either birch or maple is excellent—the friction caused by the shovel and lime quickly wearing through soft wood. There must be provision for shoveling the lime into the house, and to meet this requirement a small door must admit into the vault near the top. This door, when shut, should also be air tight.



A PROPERLY CONSTRUCTED LIME HOUSE.

in its place they handle it in barrels, always at a decidedly smaller percentage of profit.

It is not difficult, however, to keep bulk lime from slacking if the proper precautions are taken. The accompanying sketch will explain all that is known to date of the science that has a bearing on the subject. It will be seen that the vault proper is really one box inside of another, the space of six inches between them to be filled with slacked lime. There is no doubt other material that would

This principle, as described, is the one involved in the building of all lime houses which have proved satisfactory. In construction the plan may be modified, the more common change being to make the vault in the shape



BOX FOR HOLDING SMALL QUANTITIES OF LIME.

of a hopper. In this event it is better to have the boards which are set on a slant hardwood, so that the lime will not wear them rough and cling to them.

There are probably more good lime houses in Wisconsin than in any other state, due to the fact that a Wisconsin man has a patent on a lime house that has been adopted by many of the yard men. There is also another patent house—the patents on both of them, however, cover methods of construction, the object being the same, namely, to exclude the air. If the dealer has the ingenuity to build a vault that will meet this requirement he need spend no extra money for patented devices.

Every yard man who sells barreled lime in small quantities knows the perplexities attending it, particularly after the barrel is two-thirds, or thereabouts, empty. The nails with which the hoops are fastened often reach through an inch or two into the barrel, the shovel catches on these nails and perhaps the hand rakes against one of them. Often in a spirit of vexation the shovel is thrown down

and the yard man picks out the lumps of lime with his hands, and as a lumberman's hands are supposed to be so tough that slivers will not stick in them lime will not more than eat the skin from them. This lime box is a most convenient appurtenance to a lime room. It is made of 2-inch stuff, is three feet long, two feet wide, a foot and a half high, and one end is put in slanting in order that the lime may be easily shoveled from it. It holds a barrel of lime and the cover shuts closely and hooks.

The cut shows a method adopted by Nels Severson, Hollandale, Wis., for unloading lime from the car. To the door where the discharge is made the height is 16 feet. The car holds six bushels, has a trip bottom and is operated by horse power. With three men to shovel and



DEVICE FOR UNLOADING LIME.

one to drive the horse a car is unloaded in two to three hours. The track is portable, being removed when not in use. There is no reason why such a car could not be used to advantage in handling coal.

Chapter XXIV

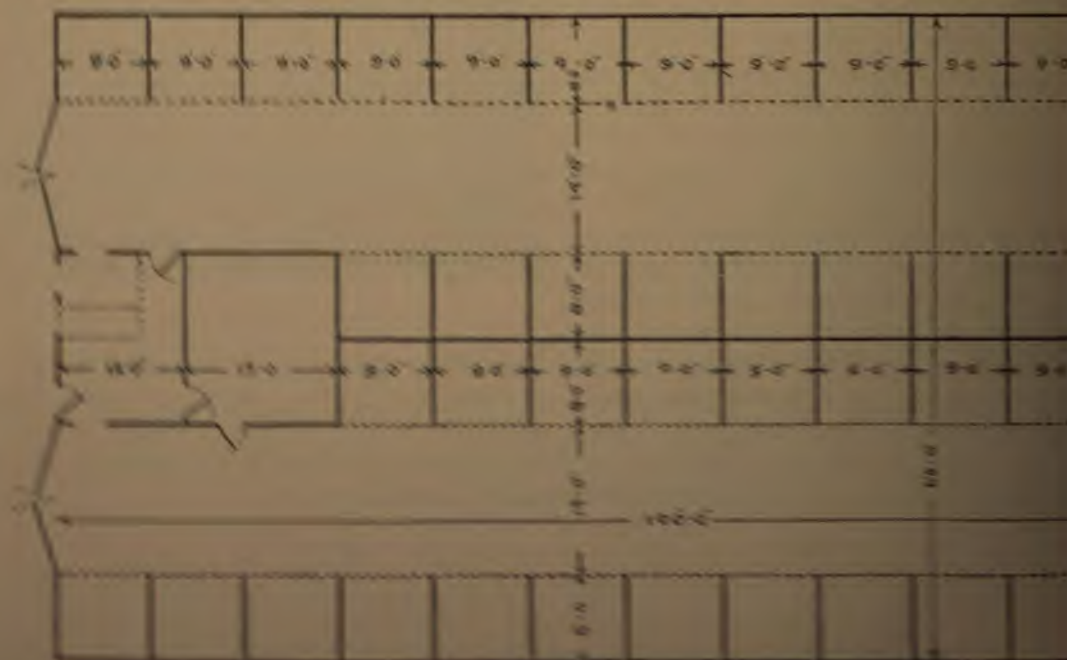
Sheds for End Storage

End storage, for the higher grades of lumber, had been practiced in the eastern wholesale markets, notably in Boston, but the first shed in which an entire retail stock was handled in this way was built in Manson, Ia., by the B. L. Willis Lumber Company, the incentive of its birth being a lack of room for a shed of a desired capacity, of another type. This shed, now owned by the Townsend-Cowan Lumber Company, is 60x100 feet, and it was said by the builders that it will accommodate 100,000 feet more than would the ordinary double deck shed of a like dimension, the capacity being increased from 300,000 to 400,000 feet. The B. L. Willis Lumber Company was afterward succeeded by the Citizens' Lumber Company, and so pleased was this company with the innovation at Manson that, under the name of the Fort Dodge Lumber Company, it built a shed of the same character at Fort Dodge, Ia.,

and afterward one at Mason City, Ia. The capacity of the Fort Dodge shed is 125,000 feet, in excess of the ordinary type of the same dimension.

The Fort Dodge shed is 100x100 feet in the clear in front, and 16 feet in the rear. There are three alleys, 14 feet wide. The width of the alley is of the elastic plan, never. If the stock on hand is heavy it may encroach upon this space with no inconvenience, as the lumber, when it is dropped upon the wagon instead of from a bin, consequently not much space is necessary. The front of the building is brick, the sides are covered with iron, the roof is graveled. At first sight it is plain that to build this shed less material is used than the more common types, and it also shows that to support the weight of the leaning lumber the side walls should be of ample strength.

The shed at Mason City is 109x165 feet



FLOOR PLAN OF END STORAGE SHED OF TOWNSEND-COWAN LUMBER COMPANY, MANSION, IOWA.

16 feet high, are of cement building 8x8x24 inches, and the roof is supported by poles. The bins around the building are 16 feet wide and 16 feet deep, the lumber is piled against the bin partitions instead of against the walls, as it does in the Fort Dodge shed. There is a space in the center of the building in which heavy dimension, posts and beams are piled, the dimension piled flat. The lumber in stock is under this one roof.

C. McClintock, under whose supervision the Hanson shed was built, would not have it more than nine feet deep, as in that shed the lumber is carried a shorter distance, he would not have them more than eight feet wide.

He believed that this type of shed will be a factor in the retail field, as certainly it deserves, if all that is claimed for it be true. Its advantages are:

1—A saving of space, as noted above.

2—Lumber will dry much more quickly—the time it is claimed—for the reason

that when standing on end the moisture escapes by following down the pores of the wood. At the foot of a pile of dimension that had been in the shed over night was a pool of several quarts of water. It is asserted, that if properly stuck, the shed will take care of lumber direct from the saw.

3—A material saving in labor, one man loading more lumber than can two from the ordinary bin, and a proportion of three to one has even been claimed. In the Fort Dodge shed there is a saving of two men, at \$50 a month each.

4—A saving of material in construction, and a system of framing that is simple. The builders of these sheds do not consider that a cupola is necessary.

5—A marked advantage that the lumber keeps clean, the dust sliding down the boards instead of sticking to them, thus overcoming to a degree the objectionable features of the sheds in which lumber is piled flat.



SHED OF CITIZENS' LUMBER COMPANY, FORT DODGE, IOWA.

thus making of it a mild sort of dry kiln. A warm room is in use for the storage of g and such other material as it is de- to prevent from absorbing moisture. At ight a small portion of the planing mill is om which the steam is piped to the shed. are 72 racks in which 200 patterns of g are stored on end, the latest approved for doors, and an elevator which hoists o an upper floor which extends over a portion of the shed. In connection with nsverse section of the shed may be seen vice with which the 36 windows in the may be opened or closed by a single nent of a lever.

the lumber in this shed is stored on end, ably being the second retail shed of this ter that was built. Its capacity is 600,- et, which would be reduced to 300,000 the lumber piled flat. The building is o feet, has two alleys, each 14 feet wide, s are 8x9 feet, and the height of the shed

will accommodate 20-foot lumber. The owners of the shed claimed that the labor necessary to handle the lumber, as compared with the common method of piling it flat, is 25 percent less. The shed is sided with corrugated iron and covered with ready roofing.



VIEW OF END STORAGE ALLEY IN FORT DODGE SHED.



PLANT OF JOHN BELL & SONS AT PONTIAC, MICH.



LOADING DECK, SHANNON (ILL.) LUMBER COMPANY'S SHED—INTERIOR.



SHANNON LUMBER COMPANY'S SHED—LOADING DECK SIDE.

**EXAMPLES OF
LUMBER SHED
CONSTRUCTION**

Example 1

Plan of Single Alley Enclosed Shed

This design shows the construction of one bent, 52 feet and 2 inches wide. The length of the shed may be regulated by increasing the number of bents, which are set on 9-foot centers.

The foundation may consist of piers, with piling foundation independent of the frame. The foundation may be of stone, or cement, as the builder may elect. An excellent foundation is a solid wall of stone, laid with a mortar made of lime and cement. This foundation should be sunk in the ground about 6 inches, and project above the ground 6 inches, or farther, if it is desired that air be admitted through tile under the piles.

A foundation constructed of stone as indicated is capable of carrying many times all the possible load of lumber that can ever be put upon it, so that it more than meets the objection which some dealers have to piling lumber on the foundation on which the shed rests. The cost of such a foundation is easily figured. A cord of stone will make considerably more than 100 feet of it. To the cost of a cord of stone add the labor of putting it in position.

The framing is designed to be amply strong for the purposes of the shed and also to resist as severe storms as any frame building will resist. In some sheds timbers are used out of all proportion to the heaviest strains that can possibly be put upon them, often 6x6s and 8x8s and 10x10s. To those accustomed to such timbers this design will no doubt appear weak, but the reader may be assured that the shed if built as designed will continue to be a good shed long after he has ceased to have use for it. The heaviest timbers used are 4x4s and 2x8s, but these are braced in such a manner as to offer greater strength in the directions needed than many of the 6x6 timbered sheds referred to. The diagonal bracing carries the

strains to the foundation. In putting in the bracing a chalk line is made fast at one end and taken to the other and then snapped, producing the line of one side of the bracing. Then the 2x4 is held on the line so made and scribed with a nail or scratch-awl, sawed and nailed in position. It may be well done by anyone who can handle a saw and hammer.

Should anyone desire a truss instead of the framing shown for the roof it can be easily made by running a 2x8 from side to side and bracing diagonally from it to the rafter with 1x4 fencing. This method is more expensive and not so strong. The roof is sheathed with shiplap, being carefully laid so that the top is perfectly smooth. Where joints in the roof boards occur they must be made directly over the nail-tie and fit perfectly. Over this sheathing is laid three-ply prepared roofing thoroughly well nailed on, then coated and sanded. Should a fireproof roof be desired it will be found in asbestos.

The covering of the sides consists of common fencing surfaced two sides and placed in the same manner as the stationary slats in a blind. This method, technically known as louver-board work, affords ventilation all the time and yet keeps out snow and rain. If it is desired to make the shed somewhat fireproof from the outside then the sides should be covered with corrugated iron. It should not be nailed to sheathing, but should be nailed directly to the nail-ties or studding, only two or three thicknesses of asbestos paper intervening. The object in putting it on in this way is to render the building more nearly proof against fires originating on the outside. The iron being so thin and the air being in contact with it on both sides it is readily kept cool by a small quantity of water in case of fire. The siding of the front and rear should be drop

siding or iron siding, as may be preferred. If iron siding is used it should be nailed directly to the studding or nail-ties without the use of sheathing.

The method of hanging the windows is shown by the drawing. No windows are included in the specifications, there being dealers who would prefer to leave the space entirely open.

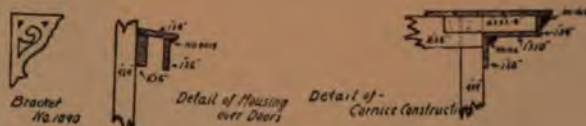
The doors are each 9 feet 3 inches wide and 12 feet high, requiring two at each end of the shed. In designing the frame of the door an effort was made to get it as strong as possible and at the same time to avoid useless weight.

The covering of the frame may be either corrugated iron, $\frac{5}{8}$ ceiling or 3-inch slats laid apart. The doors are intended to be hung upon rollers, the track to go between the dotted lines on the 2x6 marked "X," one to roll to the right and the other to the left. If, however, it is desired to have an office at one end of the shed the doors must be both rolled either to the right or left, and the center of the doorway placed so there will be track room enough for this purpose. In the event of rolling both doors in the same direction they would have to be made a trifle shorter than 12 feet. As figured, these doors are to roll on the outside of the shed. Should it be desired to have them on the inside the framing of the end bents would be slightly different, permitting of a clear passage for the doors.

The longitudinal section shown above the main shed gives a view as one stands in the driveway and looks at the ends of the piles of lumber. The lower piling spaces are intended for 16-foot, while the upper piling spaces are intended for 12 and 14-foot. This longitudinal section also shows the hinged balanced ladders. As many of these ladders as may be desired may be placed in the shed so that one need not do much walking to get to the upper deck. When the ladder is not in use it is thrown up out of the way.

Estimating stone mason's wages at \$4 a day, the wages of carpenters at \$2.50, and material at prices at which it can be ordinarily obtained,

it is thought that the cost of a shed of this description, and constructed in the manner indicated, would be about \$9 a lineal foot.



The following is an approximate bill of material for 11 bents (99 feet) exclusive of painting:

- 7 cords of stone for 8 stone walls 12 x 12, 99 feet long.
- 10 barrels lime and 2 barrels cement.
- 24 pieces 4 x 4—12, outside uprights, s1s.
- 48 pieces 4 x 4—14, 2 lines on each side of middle uprights.
- 24 pieces 4 x 4—16, 1 line on each side of uprights next drive.
- 24 pieces 4 x 4—18, roof and walk supports.
- 24 pieces 2 x 6—16, at bottom of uprights.
- 24 pieces 2 x 6—18, upper deck stays and walk projection.
- 24 pieces 2 x 6—16, support to roof nail-ties.
- 96 pieces 2 x 4—7, supporting 2x8 deck piling pieces.
- 960 feet lineal 2 x 4, braces cut between uprights.
- 200 feet lineal 2 x 12 in 9 or 18-foot lengths, on walls next driveway.
- 600 feet lineal 2 x 8 in 9 or 18-foot lengths, on other walls.
- 800 feet lineal, 2 x 8 in 9 or 18-foot lengths, upper deck piling pieces.
- 88 pieces 4 x 4—8, center supports for upper deck piling pieces.
- 800 feet lineal 2 x 6 in 9 or 18-foot lengths for walk.
- 24 pieces 2 x 8—12, rafters over driveway.
- 46 pieces 1 x 2—12, on each side of rafters.
- 900 feet lineal 2 x 6 in 9-foot lengths, nail-ties over driveway.
- 200 feet lineal 2 x 4 in 9-foot lengths for railing or piling fulcrum.
- 24 pieces 2 x 4—12 inches, supporting blocks for railing.
- 6,400 feet shiplap for roof.
- 58 squares ready roofing, including nails, coating and laying at \$2 a square.
- 814 pieces 1 x 6—9, fencing s2s, louver-boards.
- 560 feet lineal 1 x 2 nail strips for louver-boards.

1,200 feet 1 x 6 drop siding, front and rear ends.

8 pieces 1 x 4 corner strips, s2s.

1 piece 4 x 4—I6, s4s, flag pole shown on blue prints.

35 pieces 1 x 3, 18 inches, cornice blocks.

60 feet lineal cornice, for front only, made of 1 x 6 and No. 8016 frieze, 1 x 10 planceer, 1 x 4 and No. 8018 fascia, 7 brackets, No. 1840.

4 ladders, 8-foot.

86 feet lineal, housing over doors made of
1 x 8 and 1 x 6 and No. 8015.

16 pieces 1 x 4—14, for boxes to conduct ladder weights.

4 pieces 2 x 4—12, fitted at ends to receive drop siding next door.

2 pieces 2 x 6—22, for track, put on with bolts.

4 pieces 2 x 4—10, for track, put on with bolts.

8 pieces 2 x 4—10 s4s, side pieces of door frame.

8 pieces 2 x 4—10 s4s, end pieces of door frame.

20 pieces 1 x 4—9 s2s, nail-ties of door frame.

8 pieces 1 x 4—16 s2s, braces of door frame.

1 piece 4 x 6—8 sqs, corner blocks of door frame.

540 feet $\frac{5}{8}$ ceiling covering of door frame.

Hardware

4 pairs barn door rollers, ball bearings, put on with bolts.

84 feet track put on with bolts.

200 pounds 20d nails.

400 pounds rod nails.

100 pounds 8d nails.

8 pulleys for ladders.

8 strap hinges.

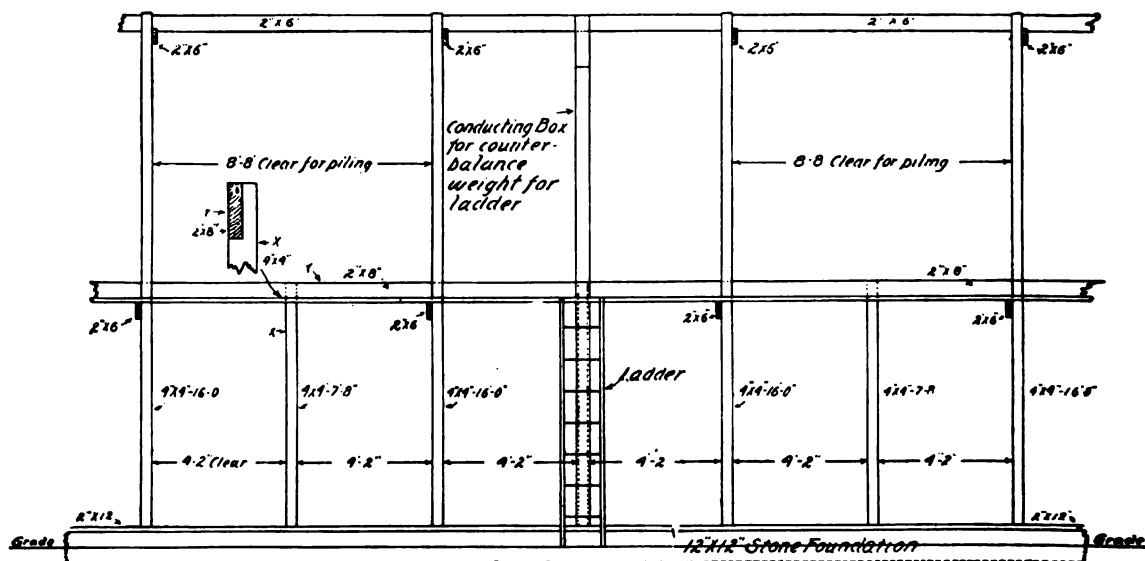
About 50 pounds of weights.

3 pounds No. 6 sash cord.

2 hasps and staples.

2 padlocks.

If sash and doors, lime, cement, paper, etc. are to be kept in the same shed, bents at some convenient part of the shed should be set aside for these purposes and made as nearly airtight as is practical. In the case of the lime this is desirable to prevent its slaking and in the case of the sash and doors and moldings, to exclude the dust.



EXAMPLE II—PLAN OF LONGITUDINAL SECTION.

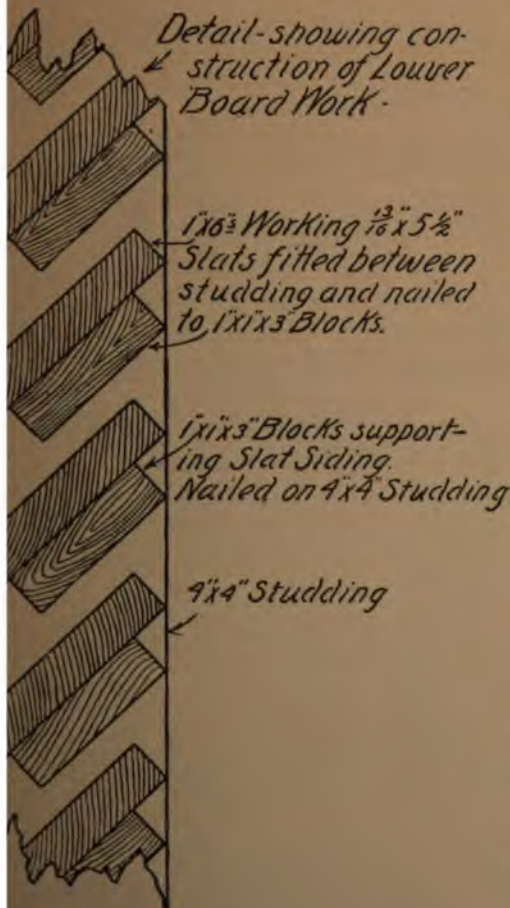
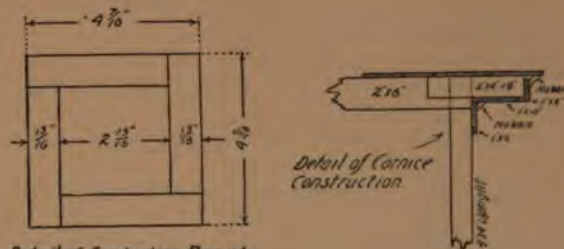
Example II

Plan of A Single Shed

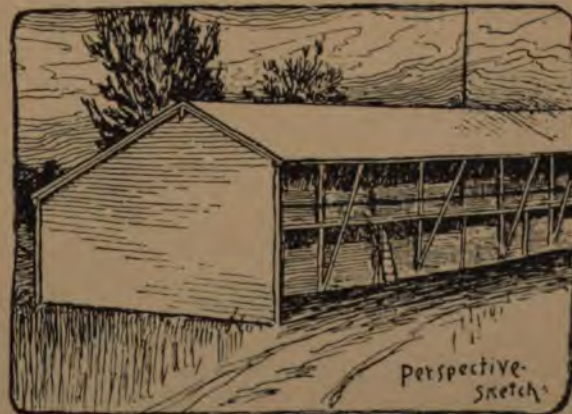
bents of this shed are placed on 9-foot foundations and the drawings show the construction of the bent, the length of the shed to be regulated by increasing the number of bents in accordance with the needs of each particular place.

The foundations shown are of stone, the bent to be 12 inches thick and to average 12 inches deep. Should any other sort of foundation be preferred it may be substituted without in any way changing the balance of the structure. The foundation is arranged to accom-

modate lumber up to 16 feet in length. For the portion of stock which may be longer than that an additional foundation may be placed at one end of the shed.



The lower portions of the bents are designed for 16-foot lumber and the upper for shorter lengths. The roof covers a space 8 feet beyond a 16-foot pile, affording protection from the weather of a load or of lumber that is awaiting distribution. The ends of the shed are sided up solid with a fair quality of drop siding, while the closed side of the shed is made up of slat or louver-board work, similar to the stationary slats in a blind, thus always allowing currents of air to pass through the shed. The roof is sheathed solid with shi-lap, then



EXAMPLE II.

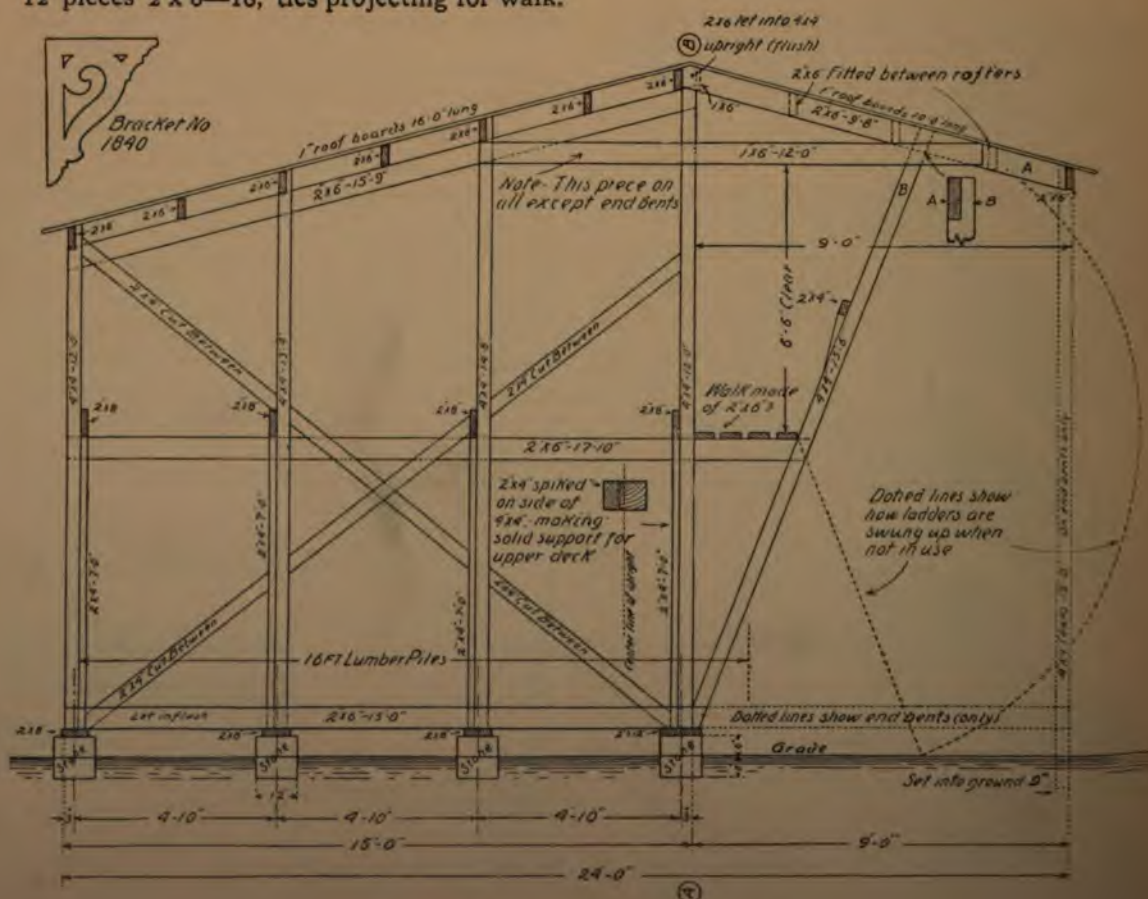
covered with a good article of three-ply ready roofing, which is given a coat of tar preparation and thoroughly well sanded.

It is estimated that the cost of 12 bents (99 feet) will be \$431.

A bill of material for the construction of this shed may be approximated as follows:

- 3½ cords of stone.
- 5 barrels lime, 1 barrel cement.
- 4 yards sand.
- 12 pieces 4 x 4—12, outside studs.
- 12 pieces 4 x 4—14, inside studs.
- 36 pieces 4 x 4—16, inside studs.
- 48 pieces 2 x 4—7, supports under 2 x 8 piling joist.
- 48 pieces 4 x 4—8, center supports under 2 x 8 piling joist.
- 2 pieces 4 x 4—16, oak, next drive on end bents.
- 24 pieces 2 x 6—16, bottom and top ties.
- 12 pieces 2 x 6—18, ties projecting for walk.

- 12 pieces 1 x 6—12, braces.
- 12 pieces 2 x 6—10, hood rafters.
- 300 feet lineal 2 x 8, in 9 or 18-foot lengths, on top back walls.
- 100 feet lineal 2 x 12, in 9 or 18-foot lengths, on top front walls.
- 400 feet lineal 2 x 6, in 9 or 18-foot lengths, walk.
- 400 feet lineal 2 x 8, in 9 or 18-foot lengths, upper deck piling joist.
- 1,100 feet lineal 2 x 6, in 9 or 18-foot lengths, roof nail-ties.
- 384 feet lineal 2 x 4, diagonal braces.
- 100 feet lineal 2 x 4, in 9 or 18-foot lengths, piling fulcrum and railing.
- 3,000 feet shiplap.
- 27 squares three-ply ready roofing, laid complete.
- 1 piece 4 x 4—20, for flag pole.
- 417 pieces 1 x 6—9, fencing, s4s, louver-boards.



EXAMPLE II—PLAN OF END ELEVATION.

280 feet lineal 1 x 3, nail strips for louver-boards.
 12 pieces 1 x 6—12, facing for outside studs on low side.
 12 pieces 1 x 4—14, boxes for weights.
 3 ladders, 8 to 9 feet, depending on grade.
 2 pieces 1 x 4—12, corner board.
 2 pieces 1 x 4—16, corner board.
 800 feet drop siding.
 52 feet cornice, made of 1 x 6 and No. 8016 frieze, 1 x 10 planceer and 1 x 4 and No. 8018 fascia.

22 cornice blocks, 2 x 4—18 inches.
 6 brackets.

Hardware

75 pounds nails, 20d.
 150 pounds nails, 10d.
 25 pounds nails, 8d, finish.
 6 pulleys.
 150 feet sash cord.
 3 pairs strap hinges.
 60 pounds weights.

Example III

Plan of An Enclosed Two-Alley Shed

These plans show a half of a shed, with two alleys and piling space on both sides of each. The structure can of course be extended as circumstances may require. The bents are on nine-foot centers, so that if but three bents were built at first there would then be considerable shed room, as it would be 27x104 feet. An office may be made at either side on front end, in which case the doors would roll toward the center.

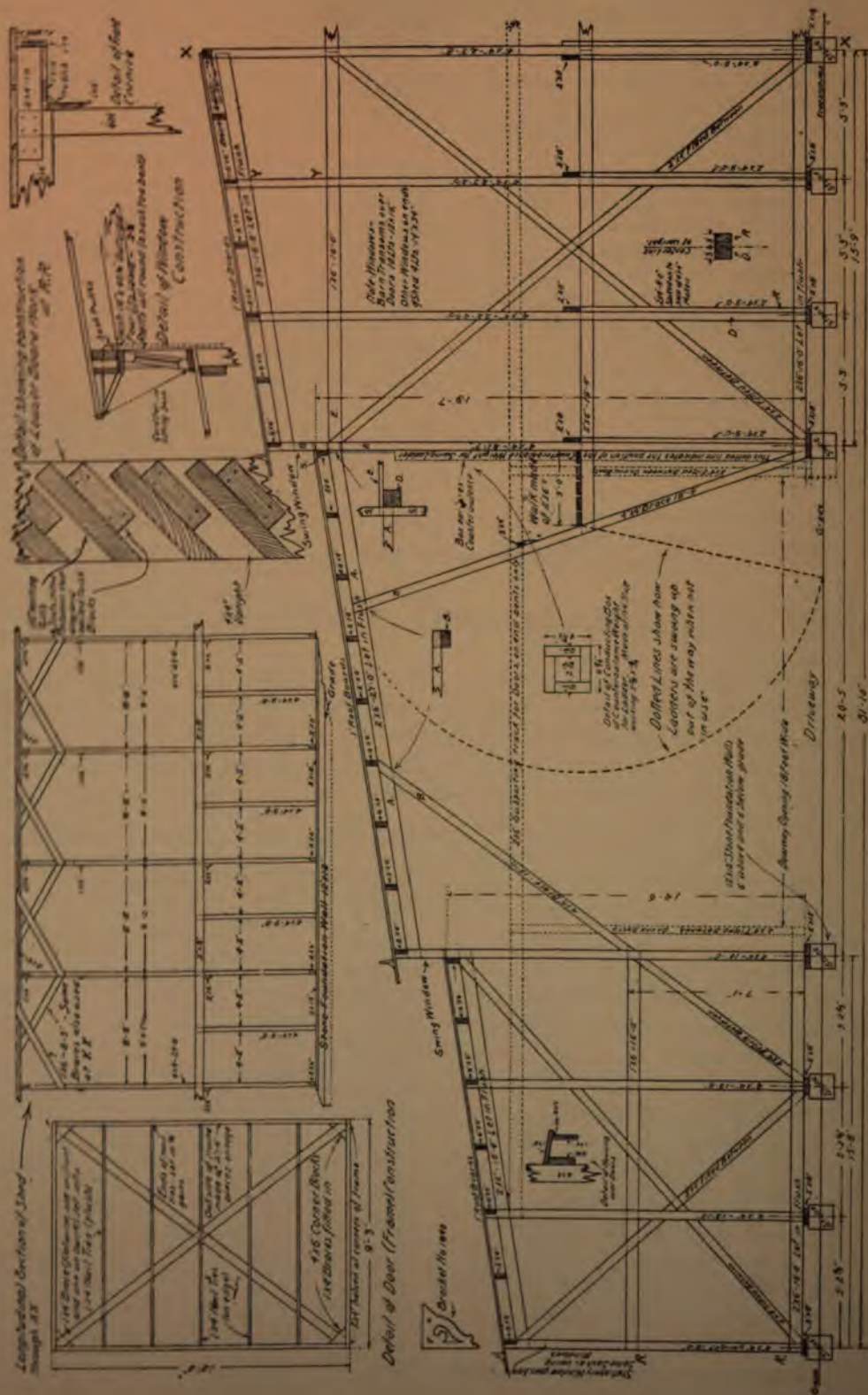
In the construction the design is to use as light timbers as are consistent with ample strength; not only on account of the economy in construction, but in order to save the shed room as well. Where this shed has 4x4 up-rights, 4x6, 6x6, 8x8, and occasionally 10x10, are commonly seen throughout the country. But it will be seen that the uprights have only the roof to carry on the one side, and in the center the roof and the material on the upper deck, and there, as shown, they are strongly reinforced. To use larger timbers would, therefore, be a dead waste of good raw material.

The piling foundation consists of 12x12 stone walls, laid with a mixture of lime and cement and capped, as shown in the drawing.

The shed complete, as shown, exclusive of painting, will cost about \$1,500 for 100 feet, or an average of about \$15 a lineal foot. Of this amount about \$300 is for labor and the balance for material.

Material for 100 Foot Shed

12 cords stone for 15 walls.
 15 barrels lime.
 2 barrels cement.
 1000 feet lineal 2 x 8.
 500 feet lineal 2 x 12.
 24 pieces 4 x 4—12.
 48 pieces 4 x 4—14.
 24 pieces 4 x 4—18.
 24 pieces 4 x 4—22.
 61 pieces 4 x 4—24.
 48 pieces 2 x 6—16.
 48 pieces 1 x 6—16.
 329 pieces 2 x 6—18.
 2000 feet lineal 2 x 4.
 24 pieces 2 x 6—22.
 84 pieces 2 x 4—9.
 24 pieces 4 x 4—20.
 24 pieces 4 x 4—12.
 24 pieces 4 x 4—8.
 77 pieces 4 x 4—10.
 22 pieces 2 x 4—8.
 66 pieces 1 x 6—8.
 39 pieces 2 x 8—18.



EXAMPLE III—ELEVATION, LONGITUDINAL SECTION, ETC.



FRONT ELEVATION OF STANDARD SHED NO. 4.

- 16 pieces 1 x 4—16 s2s.
- 8 pieces 2 x 4—12.
- 12450 feet cheap shiplap for roof sheathing.
- 120 squares ready roofing, laid complete.
- 800 feet lineal 1 x 6, gutters.
- 2650 feet drop siding for ends.
- 208 feet lineal cornice made of 1 x 6, 1 x 10, 1 x 4, No. 8016 and No. 8018.
- 30 cornice blocks, 2 x 4—18 inches.
- 22 brackets.
- 4 sash, 12 x 16, 10 lights and frames.
- 4 windows, 14 x 34, 4 lights and frames.
- 132 sash, 10 x 12, 4 lights, 2½-inch rails.
- 132 frames for same.
- 800 pieces 1 x 6—9, s2s, louver-board work.
- 550 feet lineal 1 x 2, nail strips.
- 300 feet lineal 1 x 4, corner boards.
- 4 ladders, 10 feet.
- 200 feet lineal housing over doors, made of 1 x 8, 1 x 6 and No. 8016.

Doors

- 16 pieces 2 x 4—12 s4s.
- 16 pieces 2 x 4—10 s4s.
- 40 pieces 1 x 4—9 s2s.
- 16 pieces 1 x 4—16 s2s.
- 1 piece 4 x 6—16 s4s.
- 1100 feet 5/8 x 6 ceiling.
- 8 pieces 2 x 4—18, s4s, clear, bars to fasten doors.

Hardware

- 8 pairs ball bearing barn door hangers put on with bolts.
- 150 feet track put on with bolts.
- 250 pounds 20d spikes.
- 400 pounds 10d nails.
- 100 pounds 8d nails.
- 44 sash pulleys.
- 8 pulleys for ladders.
- 15 pounds sash cord.
- 60 pounds sash weights.
- 44 pairs loose pin butts.
- 8 dozen screw eyes.
- 8 hasps and staples.
- 100 feet down spout.
- 200 feet flashing over housing.

Example IV

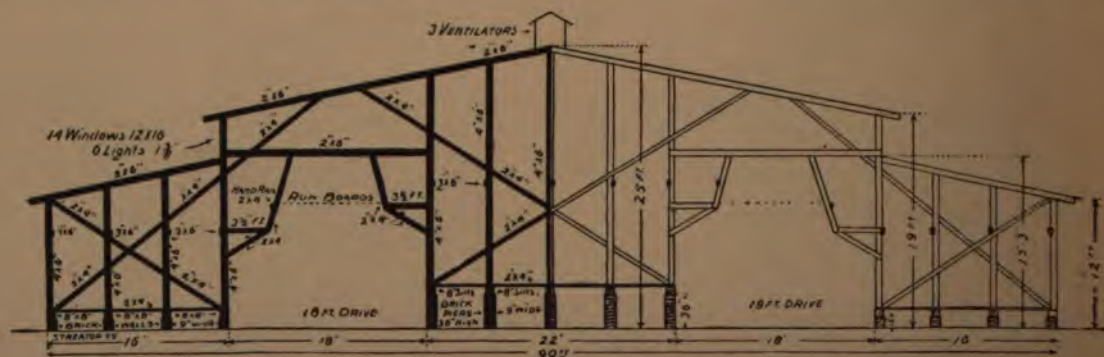
Called A Model Shed

It would be difficult to lead J. V. Price, of Casey, Ill., to believe that there is a better shed than his. The sectional view reproduced herewith will give a fairly good idea of the shed, particularly in connection with Mr. Price's description of it: In size the shed is 90x112 feet, and 12 feet high at the lowest point. The foundation consists of 13 brick walls projecting out of the ground a little, on top of which are 8x8 sills securely pinned together. As may be noted from the sectional view, the five center walls are higher than those on the sides. This increased height extends back 70 feet. The object in leaving this portion higher was to facilitate the handling of heavy articles, such as lime, cement, etc. This space is in use for sash, doors, blinds, cement, etc.

The sectional view brings out what is considered a good way of bracing a shed. It consists in cutting 2x4s between the uprights, starting in every case at the foundation and continuing a straight line of bracing to the top. This method transfers all the strain direct to the foundation, which is the end always sought in scientific bracing. It will also be noticed that the uprights are all 4x6. This imparts great strength; in fact, it would seem a strength greater than is required, as the uprights do not carry anything except so much

as may be piled on the upper deck. It would seem that 4x4 would have been sufficiently strong; and yet too much strength is certainly not a great objection. The bracing of the shed from end to end, or in the other direction from that shown by the cross section, is equally scientific and completes an exceptionally strong framing system.

Bents like that shown in the sectional view are placed eight feet from center throughout the length of the wall. This 8-foot space leaves the piling spaces of desirable size, besides affording the requisite strength for the superstructure. Around the outside, though it is not shown in the sectional view, 2x4 nailing girts are cut between the posts at the proper distance, and the outside is covered with shiplap up and down nailed to the girts. Eight-inch No. 2 soft pine shiplap was used. The roof is sheathed solid with No. 3 boards and then covered with pressed steel standing seam roofing. This roof not only makes a water tight and economical job but affords a very good fire protection. Fires in lumber yards are often started by the cinders falling from burning buildings at some distance. The shed is lighted by fourteen windows, six lights, 12x16, on each side in position as indicated by the cross section. These windows are hung on



SECTIONAL VIEW OF J. V. PRICE'S SHED AT CASEY, ILL.

ges at their tops, so that in summer they may be opened. Additional ventilation is furnished by louver-board work in the shape of three large ventilators 4x6 and 4½ feet high located at the comb of the roof. These are particularly useful in the winter when the shed is entirely closed and ventilation at any other point is not to be obtained.

The driveways are 18 feet wide. On each side of each driveway are walks three and a half feet wide. These driveways are connected

by run-boards at four points on each side, so that one need not walk the length of the shed in order to cross over. When the walks reach that portion of the center in which is located the sash and blind house there are steps which enable one to rise up to the level of the deck or, rather, the top of the sash house, which is utilized for piling stock of various kinds. One portion of the space over sash house and at the front end is used as a molding rack. This rack is 24 feet long, and has fifty-two pockets.

Example V

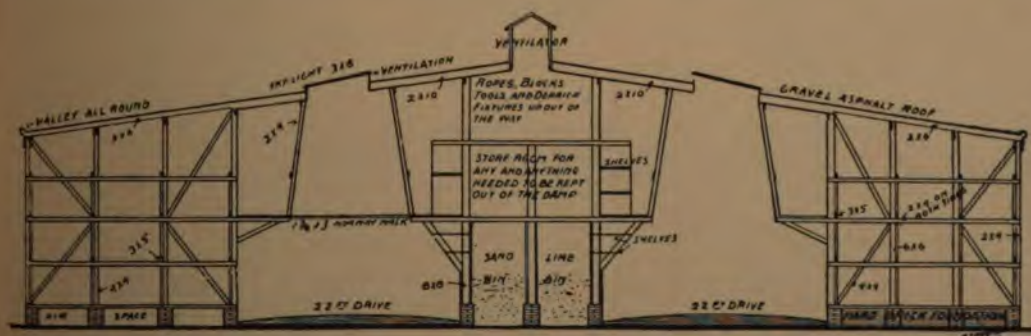
A Shed of Large Capacity

This shed of E. M. Long & Son, of Cadiz, Ohio, was built with the idea of covering as little space as possible, and at the same time giving it a capacity equal to that of yards covering two or three times the space and equipped with small sheds, warerooms, shops and other buildings needed for carrying a general stock. The general plan of this shed is shown in the accompanying drawing, and the details of its construction are given by the firm as follows:

"All the foundations and bearings are made of hard brick and tile and these are covered with 2x6s on inside walls and 2x8s on the out-

side. On this foundation is placed the frame work, which is principally composed of 2x4 and 2x6, used singly and spiked together. The rafters over the lumber spaces are 2x6 and over the driveways 2x10. The lumber supports for the second story are 3x5, 3x6 and 6x8 hardwood. All the cross partitions in the bins are made of the same material as the upright supports.

"The entire shed is sided with drop siding, and is supplied with all the windows that are necessary for the lighting of all the rooms in both stories. The roof is covered solid with surfaced sheathing, this covered with an



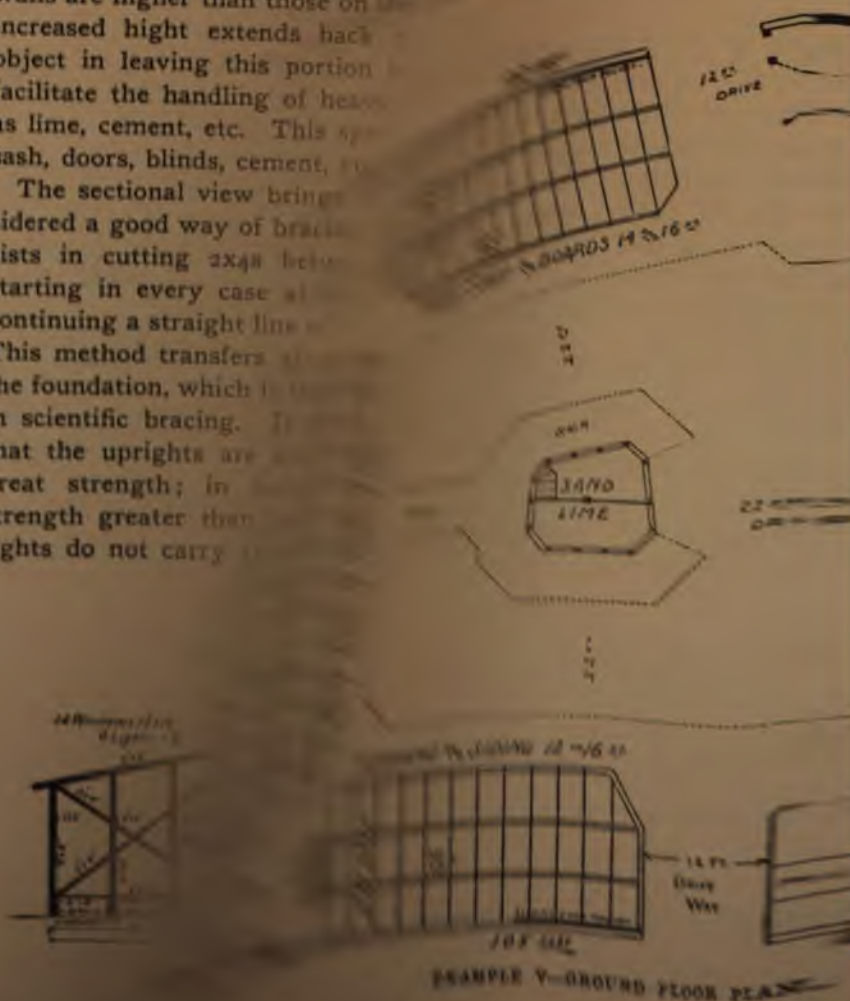
EXAMPLE V-ELEVATION.

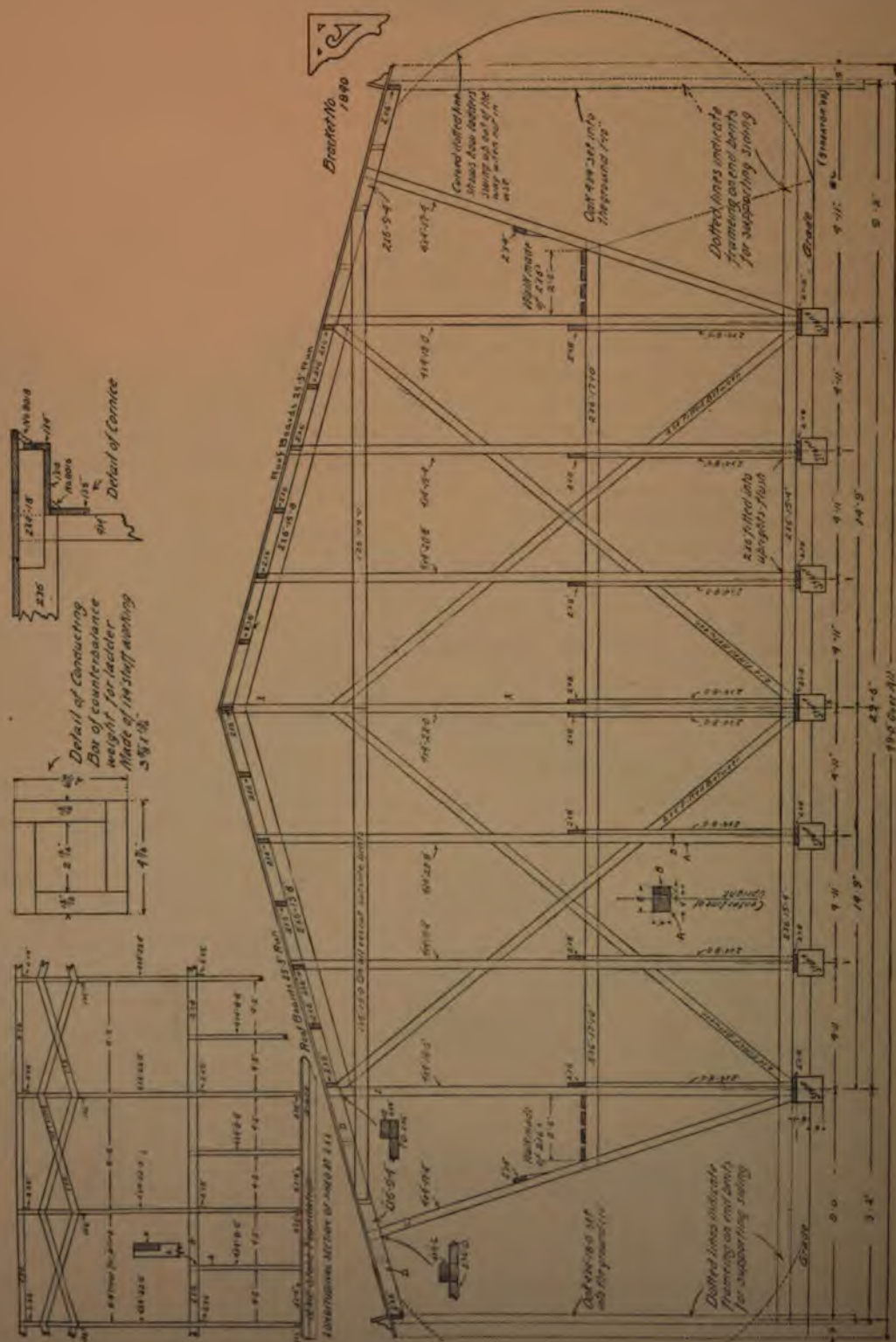
Called A

It would be difficult to lead J. V. P. Casey, Ill., to believe that there is a better than his. The sectional view reproduced with will give a fairly good idea of it, particularly in connection with Mr. description of it: In size the shed is 12 feet, and 12 feet high at the lowest foundation consists of 13 brick walls out of the ground a little, on top of 8x8 sills securely pinned together, as noted from the sectional view, the walls are higher than those on the increased height extends back to the object in leaving this portion to facilitate the handling of heavy material as lime, cement, etc. This shed is for sash, doors, blinds, cement, etc.

The sectional view brings out the fact that it is considered a good way of bracing the shed. It consists in cutting 2x4s between the walls, starting in every case at the top and continuing a straight line down to the foundation, which is the principle in scientific bracing. It is noted that the uprights are of great strength; in fact, the strength greater than the uprights do not carry the load.

Enough for teams to go in and out the long way. You will notice that this is to suit the location of the shed taking into account the ground makes the difference than on the other, the benefit which would be on the level. You will notice the supports the roof articles that would be in the rooms on the form of this case, the upper side to at





or walk. In it we have an outside door and also an inside one, permitting us to see from our desks into the yard. The office is finished in yellow pine and oak and our desk is shut in by chipped glass, after the style of bank fixtures.

"The second floor we use for all kinds of lumber, mostly light material, and the corner rooms for sash, doors, screens, mantels, frames, posts, brackets and moldings. We have a five-foot walk that extends around the entire interior and is connected with the center. From this we go to all the rooms and stairways to the lower floor. This walk is made of 2x3 strips about 1½ inches apart so as not to cut off the light from below. In general, our shed

is intended to carry all kinds of building material, and everything is arranged in the best possible way for convenience.

"One of the advantages we might mention in addition to what we have already said is the saving in insurance, the cost being only one-third of the cost where the shed is open. The cost of this building was between \$1,500 and \$2,000, and it is constructed in the most substantial manner. As yet we have found very few disadvantages in its arrangement. The shed is provided with water from the city main for watering horses, sprinkling driveways and use in the office."

The shed while irregular in size could be built on ground otherwise proportioned.

Example VI

Plan of A Double Shed

These plans are for a type of shed that is fast gaining in popularity. Elsewhere considerable attention has been paid to it. The estimated cost of construction is \$7.50 a lineal foot. The bill of material, for 99 feet, is as follows:

- 6 cords rock.
- 9 barrels lime, 2 barrels cement.
- 6 yards sand.
- 4 pieces 4 x 4—16, oak.
- 24 pieces 4 x 4—18, braces.
- 24 pieces 4 x 4—18, uprights.
- 24 pieces 4 x 4—20, uprights.
- 36 pieces 4 x 4—22, uprights.
- 84 pieces 2 x 4—8, supports for upper piling joist.
- 77 pieces 4 x 4—9, supports for upper piling joist.
- 1100 feet lineal 2 x 4, diagonal braces.
- 300 feet lineal 2 x 12, 9 or 18-foot lengths, top stone wall.
- 400 feet lineal 2 x 6, 9 or 18-foot lengths, top stone wall.
- 800 feet lineal 2 x 6, 9 or 18-foot lengths, walk.

- 200 feet lineal 2 x 4, 9 or 18-foot lengths, railing.
- 700 feet lineal 2 x 8, 9 or 18-foot lengths, piling joist.
- 2100 feet lineal 2 x 6, 9 or 18-foot lengths, nail ties.
- 26 pieces 2 x 6—16, cross ties at bottom.
- 24 pieces 2 x 6—18, cross ties at center.
- 48 pieces 1 x 6—10, cross ties at top.



EXAMPLE VI—PERSPECTIVE. END OF SHED IS SHEATHED TO EDGE OF HOOD.

24 pieces 2 x 6—10, hood rafters.
 24 pieces 2 x 6—16, support to roof nail ties.
 5850 feet shiplap.
 22 pieces 1 x 6—12, longitudinal bracing.
 53 squares ready roofing laid complete.
 2400 feet drop siding.
 104 feet lineal cornice 1 x 6 and No. 8016
 frieze, 1 x 10 planceer and 1 x 4 and
 No. 8018 fascia.
 54 cornice blocks, 2 x 4—18 inches.
 10 brackets.

1 piece 4 x 4—20, flag pole.
 4 ladders.
 16 pieces 1 x 4—14 s4s, ladder weight
 ductors.
 30 feet lineal 1 x 8, gutter strips.
 8 hinges for ladders.
 8 pulleys.
 200 feet sash cord.
 150 pounds nails, 2d.
 200 pounds nails, 10d.
 50 pounds nails, 8d.

Example VII

A Model Kansas Shed

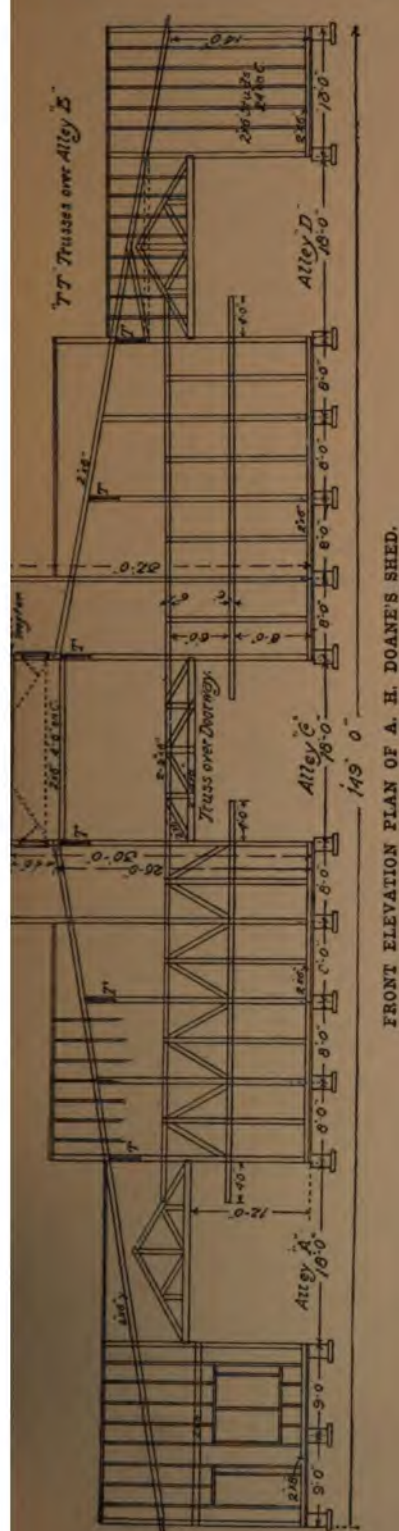
If "parlor plant" can properly be applied to a lumber shed this one, built by A. H. Doane, Winfield, Kan., deserves to be so called. It is said by the traveling men whose territory is Kansas, and who consequently have seen all the sheds, that this is the finest in the state. It is the production of a man of rare taste and strong personality. A letter received by the writer from Mr. Doane will explain many details of the shed:

"I send you under separate cover blue prints of the shed I am going to build. Pardon me for troubling you, but really I want to make no mistake. I have read all of your shed

articles with a great deal of interest; in I have made them a study and the blue p I send you are the result. My shed will the north and be located within 300 feet o business center—the best location in tov think. The price of property is no ol Location is what I am looking for. Get to the people is my motto. Main trav streets adjoin on the north and east and foot alley in the rear. The building wil on stone piers 6 inches above the side grade. The rear end (from the south, w we get the most of our breeze) will be sl up for a space of 14x80 feet, with 1x4



THE MODEL SHED OF A. H. DOANE, AT WINFIELD, KAN.



FRONT ELEVATION PLAN OF A. H. DOANE'S SHED.

leaving a space of an inch and a half between the strips; also the west side the same excepting the space that will be occupied by the stable. [Later on Mr. Doane decided not to have a stable in the shed.] This, with the windows in the sides and ends and 32 in the cupola, looks to me as if it would furnish plenty of ventilation.

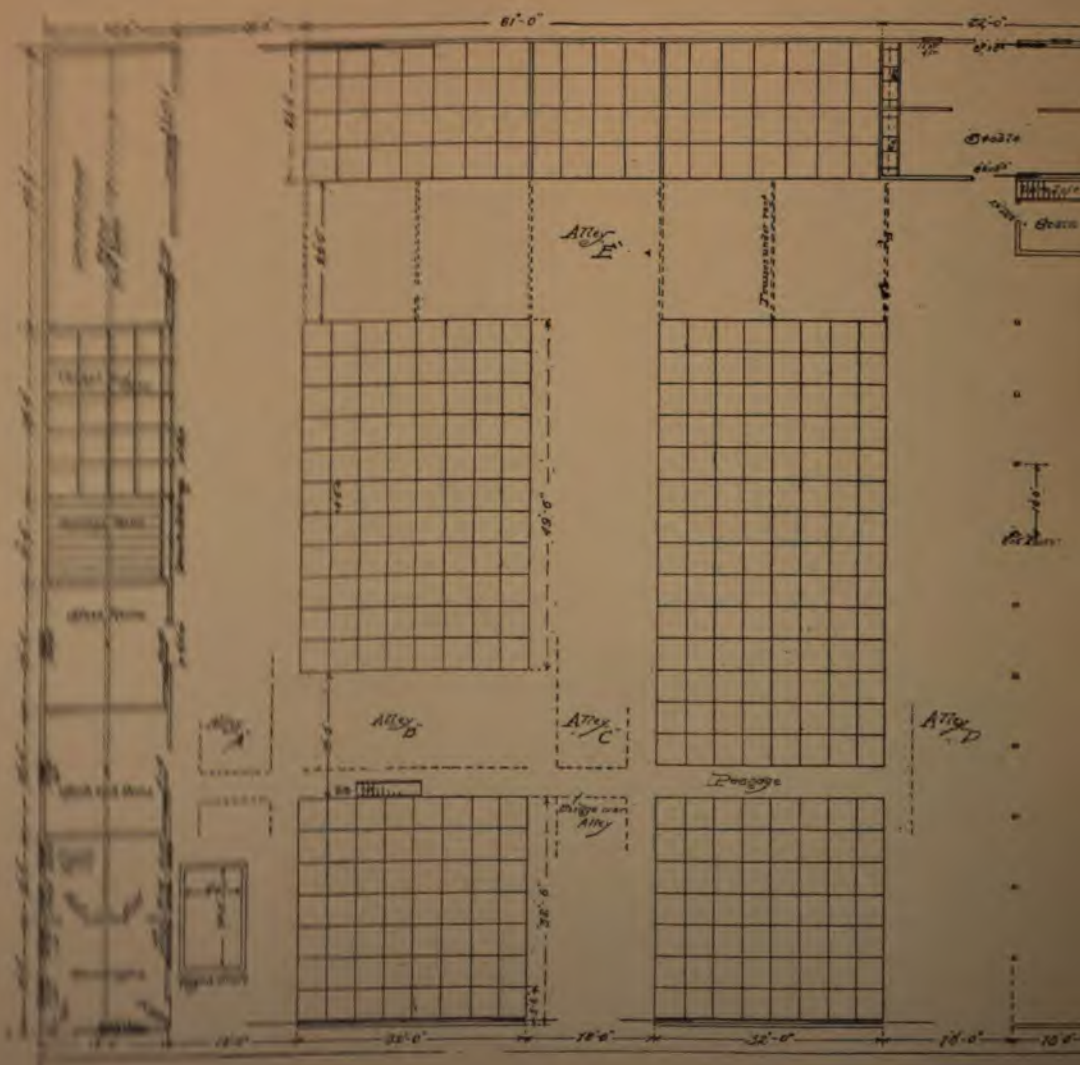
"If you notice, the doors will swing in pockets; this puts them out of sight, also avoids their being torn off the hinges by careless driving. On the east side the shed will be two decks high [this was afterward changed to one] and in the center three decks. The west side will be used for shingles, lath, posts and other material not piled in bins. On the south, where I will keep the most of my dimension, the bins will run clear up, and each bin will have a capacity of a car or more of lumber. Casings, base and moldings will be kept in a dark, dustproof bin with doors so arranged as to slide upward. There will be two offices—one public, the other private. There will also be a small room for fancy glass doors, all of them hung to a wall rack so that each door will swing independent of the others. In this way we will not have to lift them when showing them to a customer. There will also be a room with tables and chairs for the accommodation of farmers or others who would like a nice, quiet, clean place in which to eat their lunch or to leave their packages when in town. I will build 140 feet of hitch rack so that they can drive to Doane's and feel that they are welcome whether they buy today or not. The roof I have figured on considerably and have about come to the conclusion that I will use old fashioned pitch and gravel. If properly put on it ought to last 15 or 20 years at least. If not too much trouble I should be pleased if you would look over my plans and if there is any improvement that you can suggest I would take it as a favor if you would do so. I want to build a model shed and now is the time to correct any errors. I shall use drop siding, pattern No. 20, for the front and the east side. When done I want it said that

Doane, at Winfield, has the best arranged shed in the state."

The shed is 140x149 feet, and its capacity 1,500,000 feet of lumber. There are eight dark, tight apartments, 47½x28 feet, for molding, base, case, etc. The alleys are 18 feet wide and treated with gravel and clay. There is a fire plug in each alley. The foundations are of stone, 750 in number, and are laid in the ground 1½ inches. Before the enterprise was begun the city engineer struck the levels. There were nine carloads of lumber in the

shed and it was built in 20 days after foundations were in.

The private and general offices are decorated, and in the former pictures hang on the walls. In the general office, hung on the wall, will swing, is a large convex mirror, according to its position, makes one look as large as a hogshead, or as slim as a lath. Farmers pose before this glass, tell their wives and children what "gol darn" looking they made of them, and then the family will come in and see what a funny glass



GROUND FLOOR PLAN OF A. M. DOANE'S SHED.

There are leaded windows and hemp matting to walk upon. The room mentioned in the letter, designed as a resting place for the wives and children of the farmers, has shades and curtains. Whenever there is a show, or celebration, seats are placed in front of the shed for the accommodation of those who may want to see the procession, on any such occasion it being understood there is sitting room in front of Doane's shed.

The most unusual advertising feature is the display of a variety of flags. There are 20 of these flags, each 20 feet long, representing the different nations. The floating of one of them never fails to excite curiosity. The people of the town who are not up in flag lore want to know what country it represents, and oftentimes the question is asked by telephone. The newspapers comment on it. "It costs something, but it excites interest," said Mr. Doane. On proper occasions the stars and stripes are never neglected, neither does Mr. Doane neglect to run up the flag which bears his own name in large letters. He wants "Doane" sandwiched liberally with the lions, dragons, elephants, stars and new moons.

It is asserted by Mr. Doane, however, that his shed itself is the great advertisement. It cost \$5,000, and he thinks it is richly worth

the money. For the year following its completion he sold more lumber than he had ever hoped to sell in any 12 months. The great majority of dealers are of the opinion that the people of the town and the surrounding country know where they are and if they want lumber they will come for it. This Kansas dealer bases his hopes for trade on no such proposition. He wants the people to talk about him and if he could he would have them dream about him.

Mr. Doane prefers having his lumber hauled to doing it himself, the teams of one drayman doing the work exclusively, hence the men learn to handle the lumber as their employer would have it handled. The lumber is brought from the railroad at a certain price per car, and when it is delivered, an aluminum check on which is stamped the required amount is given to the driver for every load, and at the end of the month the checks are presented and cashed. This method, which is worthy of adoption by others, saves the details of bookkeeping, and as the driver knows that the check represents the amount he is to receive for the load he is sure to call for them.

The photograph reproduced here was taken before the curbing was put in.

Example VIII

An Open Pole Shed

The taste of the owner of this shed, M. H. Hand, Plymouth, Wis., is not for a hood, therefore there are those who will think that in this respect the shed is deficient. It was built over the piles of lumber instead of the lumber being placed in the shed after its completion as is generally the case. To accommodate in this way lumber that is already in pile would be out of the question with a shed the frame of which rests on sills.

In the construction of this shed there was

no studied system of bracing, the poles supporting so strongly such a system was regarded as unnecessary. Owing to this support it was thought an easy matter so to tie the poles together that they would stand any strain they would be called upon to bear. This may be said to be true of pole sheds generally; they are anchored to the ground, thus doing away with the necessity of any complicated or even particular system of bracing, on this account the saving of timber in the

structure being material; and not infrequently there has been a saving in a carpenter's wages as well, several sheds of this character having been built the work on which was wholly done by the yard force.

In size the shed is 38x198 feet, five feet wider than many sheds of this type, thus affording room for easy piling in the rear of the poles. From end to end it is a continuous piling ground, nothing interfering that will separate the piles farther apart than is necessary for ventilation. The shingles were a cheap grade and the roof board No. 3 hemlock.

The following is a bill of specifications:

- 12 25-foot, 6-inch cedar poles.
- 24 16-foot, 6-inch cedar poles.
- 11 pieces 4 x 6—18 ridge plate.
- 22 pieces 4 x 4—6 braces.

- 22 pieces 2 x 10—20 purlin.
- 24 pieces 2 x 6—10 purlin posts.
- 22 pieces 2 x 8—16 collar beams.
- 20 pieces 2 x 6—22 brace.
- 88 pieces 2 x 10—18 plates.
- 22 pieces 2 x 8—18 plates.
- 44 pieces 2 x 6—4 braces.
- 202 pieces 2 x 6—24 rafters.
- 24 pieces 2 x 6—20 to the shed fr
plate to plate.
- 5 pieces 2 x 6—20 end girts.
- 650 feet No. 2 hemlock boards for end
- 500 feet lineal 1 x 4, S I S, No. 1 heml
for fascia.
- 9,000 feet No. 3 hemlock boards.
- 90,000 shingles, laid 4-in. to the weather.
- 750 feet roof siding.
- 120 feet 2 x 4, for front end.
- 8 pieces 1 x 10—12, S I S.
- 4 pieces 1 x 6—12, S I S.
- 48 feet 4½ crown molding.
- 48 feet 2½ bed molding.



VIEW OF M. H. HAND'S SHED.

Example IX

The Wilbur Type of Shed

George H. Wilbur, head of the Wilbur Lumber Company, would not build a shed except it was supported by poles, or without a track entering it so that lumber may be unloaded directly from the car into the bin, unless circumstances compelled him to do otherwise, these being the two distinctive features of what has become somewhat widely known as "Wilbur shed." This company has several large sheds in Wisconsin, Illinois and Iowa, the one illustrated, located in Decorah, Iowa. It is believed that an interior view will best show the construction and arrangement of the shed, and from this illustration it will be seen that the system of framing is simple, as it is in all pole sheds, there being an absence of a maze of braces and posts invariably seen in the larger inclosed shed framed along ordinary lines. With this interior view as a guide the competent carpenter would have no trouble building a shed that would serve as a duplicate.

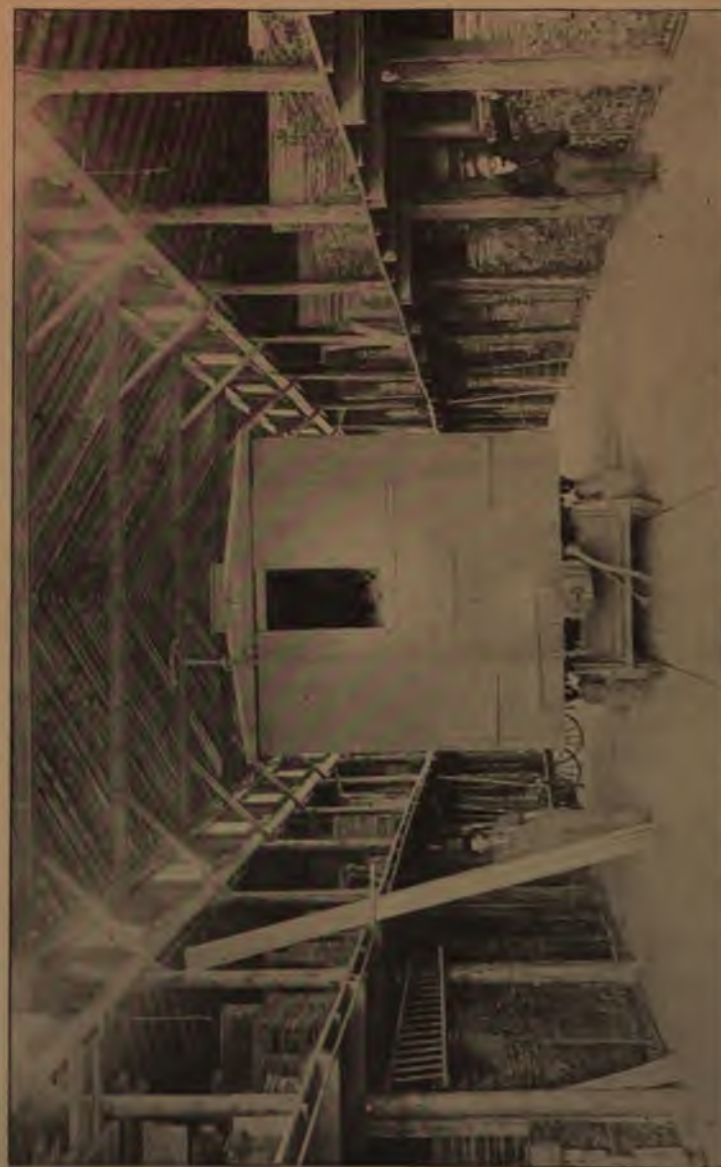
A notable feature is that the upper deck has bearings of its own, thus avoiding any chance

for the weight of the lumber pulling the shed out of true, notwithstanding the 78 poles used in the building, set four feet in the ground in concrete, would seem to render this precaution unnecessary. In the interior view may be seen the style of bearing used in the lower deck—blocks nailed between two pieces of dimension, with space between the blocks for ventilating purposes, this device resting on cedar posts flattened on one side.

The 6-inch posts are set every 16 feet, the outside ones 20 feet high, and those next to the alley 30 feet. The distance from floor to peak is 34 feet. The space between each two sets of these posts is divided into two bins, the bins on one side of the shed being 8 feet high and on the other 9; on one side 16 feet deep and on the other 22. The platforms are 4 feet wide, and along the edge of the entire length of one of them extends a water pipe with a cock at each end and one in the middle, to be used for sprinkling or in case of incipient fire. The alley is 30 feet wide, leaving a driveway



SHED OF THE WILBUR LUMBER COMPANY AT DECORAH, IOWA.



INTERIOR OF THE WILBUR SHED AT DECORAH, IOWA.



SHED OF WEST ALLIS (WIS.) LUMBER COMPANY.

in office front, 3 plate glass windows, of one light each, 4x6 feet; over office, warm room that will hold two cars of flooring; scales in

the alley alongside the office; capacity, 1,500,000 feet. The shed is unlike the typical one that has been built by Mr. Wilbur inasmuch as it is not entered by a railway track, in this instance it being impracticable. The lumber is handled from car to pile by a cart system, there being 22 carts, which cost \$20 each, and on which 4,000 feet can be carried, hence were it necessary 80,000 feet of lumber could be taken from the cars and the carts wheeled under cover, the lumber to be piled when the yard force were at liberty to do it. As the yard adjacent to the railway track, as well as the alleys, are planked and smooth, the carts can be handled with ease, but should the load be too heavy to be drawn by hand there are wheels which can be attached to the tongue and a horse made to do the work. This is one of the most complete plants of the country.



EXAMPLE X—SHED OF THE CHICAGO LUMBER COMPANY, OMAHA, NEB.—See Next Page.

Example X

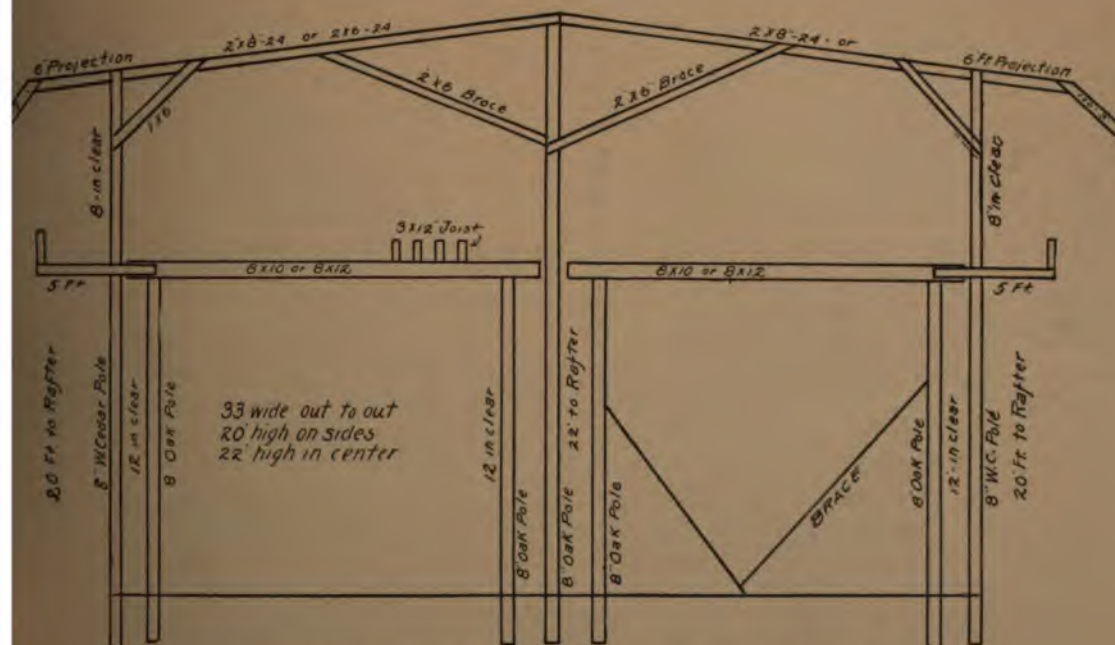
Simple Two-Deck Shed

for economy, general utility and appearance, the shed of the Chicago Lumber Company of Omaha, Neb., has been pronounced by experienced lumbermen as superior to all others by them. It is the pride of President Colpetzer, of that company, and represents the best he has learned in shed building during an extended experience. The company has 3,090 square feet of shed, all of a similar type, the others, however lacking the second deck and other details of platform, guard rail and so on. This yard man objects to the inclosed shed on the ground that it collects so much dirt. In the wide, open shed he claims the dirt blows through instead of lodging and raining.

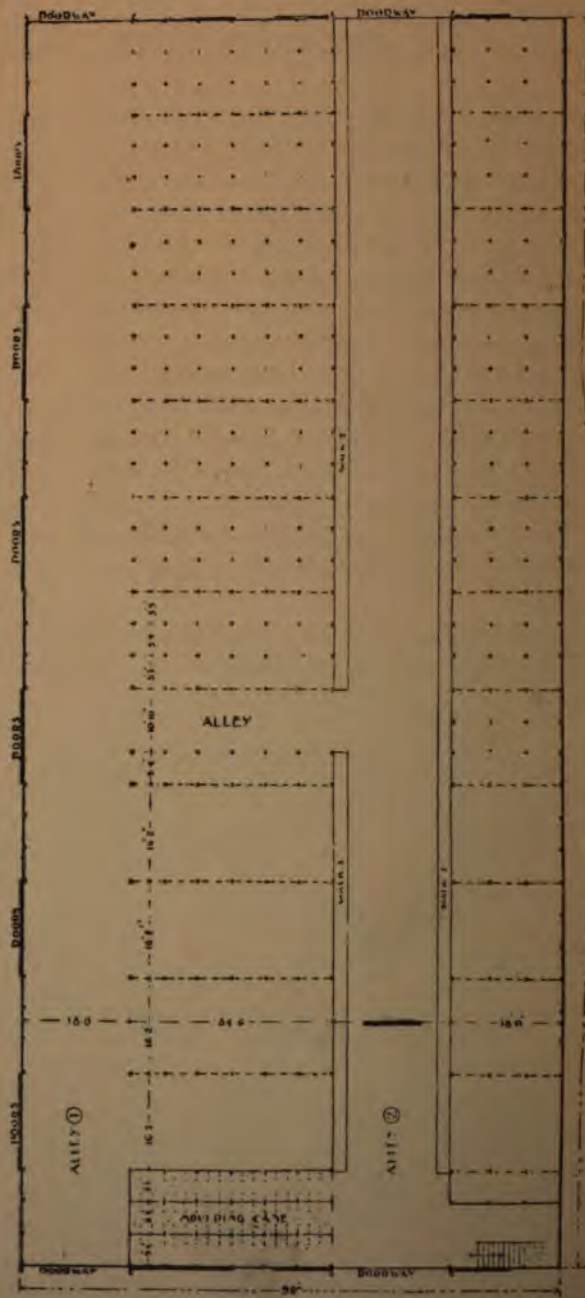
In construction, as will be seen, the shed is simplicity itself. Given the material and he could be a very poor mechanic who could not

superintend the building of it. In the front end is the room in which molding is stored on end. Mr. Colpetzer handles a large amount of molding, has had racks of various designs, but was not satisfied until he adopted the present method, which, he says, is a money saver.

A feature peculiar to the shed is that the second deck rests on a foundation of its own, this support being 8-inch oak posts set in the ground. Ordinarily when a second deck is built in a pole shed the poles are regarded as sufficient strength to support it, but in this instance no risk was taken. The shed throughout is built extra strong, no pole measuring less than eight inches. The roof boards are unmatched and are covered with ready roofing. The shed is 33x264 feet and was built for \$1,500.



EXAMPLE X—FRAMING OF CHICAGO LUMBER COMPANY'S SHED.



EXAMPLE XI—PERSPECTIVE AND FLOOR PLAN.

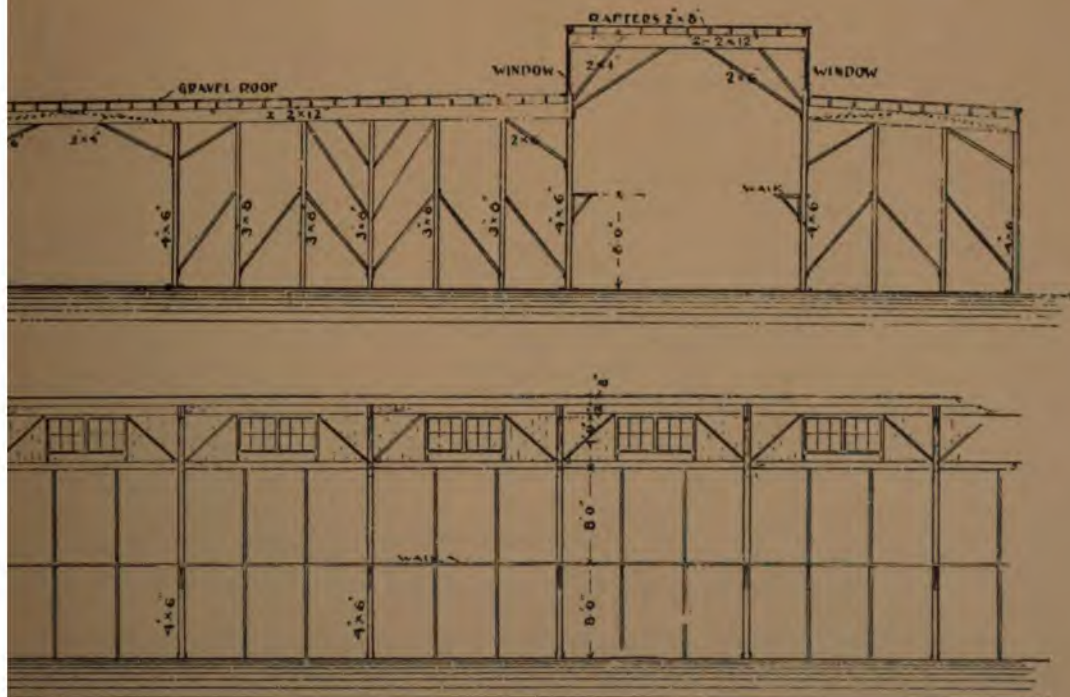
Example XI

Cheap Shed of Large Capacity

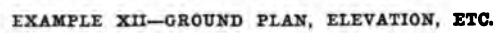
e, simply constructed shed is that of E. Burns Lumber Company, Chicago. and size is 90x210 feet. It is not orthodox in the arrangement of its end bins, inasmuch, as ordinarily the alley shed would have another row of side the alley, marked No. 1. This may be for a double reason; first, to modate the shed to the ground space; the lumber from the cars may be placed in the shed through the doors, and in the plan. The switch will hold s. It will be understood that the may be reduced to suit a smaller business is done by this company. The cost shed was \$3,187.97. The labor cost of the nails \$50. The items required for construction are as follows:

Bill of Material

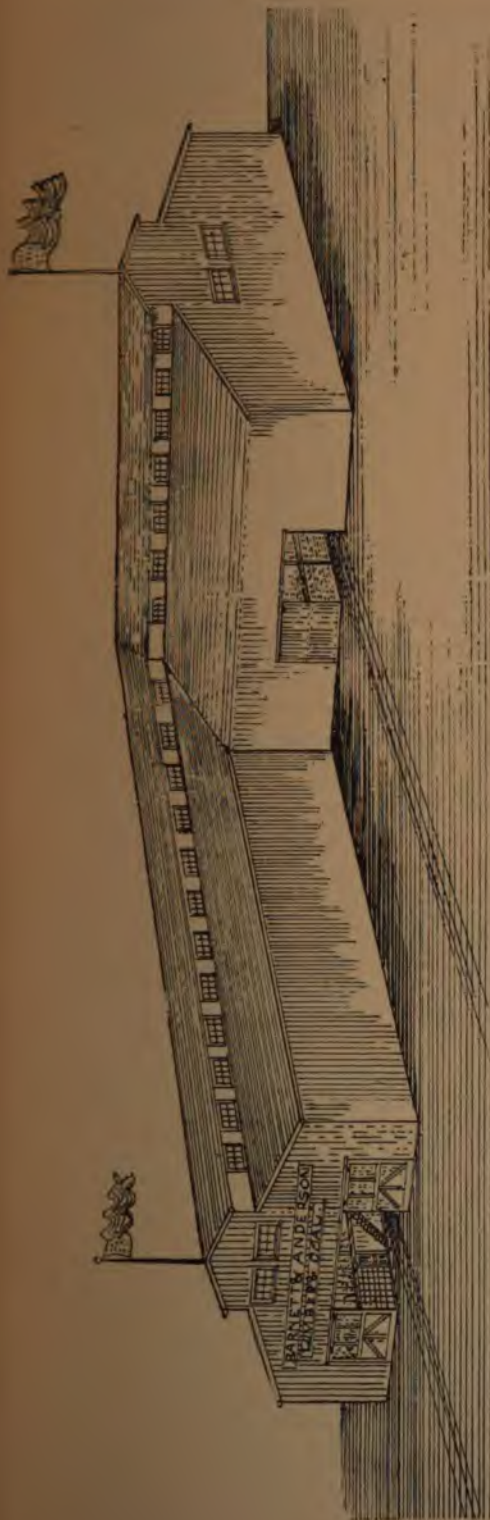
272 pieces	4 x 6—16 outside posts, 8,704 feet.
203 pieces	3 x 8—16 interior posts, 6,496 feet.
155 pieces	2 x 12—18 girders.
55 pieces	2 x 12—16 girders, 7,340 feet.
55 pieces	2 x 12—20 girders, 2,200 feet.
220 pieces	2 x 6—12 braces, 2,640 feet.
	3 x 12 hemlock scaffold, 1,200 feet.
658 pieces	2 x 8—16 rafters, 13,818 feet.
	2 x 4, 3,000 feet.
	1 x 12—16 siding s. 2 s., 8,416 feet.
	3/8 x 3 battens—lineal, 8,416 feet.
	6-inch No. 2 D. & M. sheathing around sash, 1,800 feet.
	48 sash lt. 12 x 16, 6-light.
	Hemlock plank, 3-inch, for drive-ways, 23,940 feet.
	1 x 6—No. 3, D. & M. roof, 23,900 feet.
	189 squares, 3-ply roofing.



EXAMPLE XI—END ELEVATION AND LONGITUDINAL SECTION.



Example XII

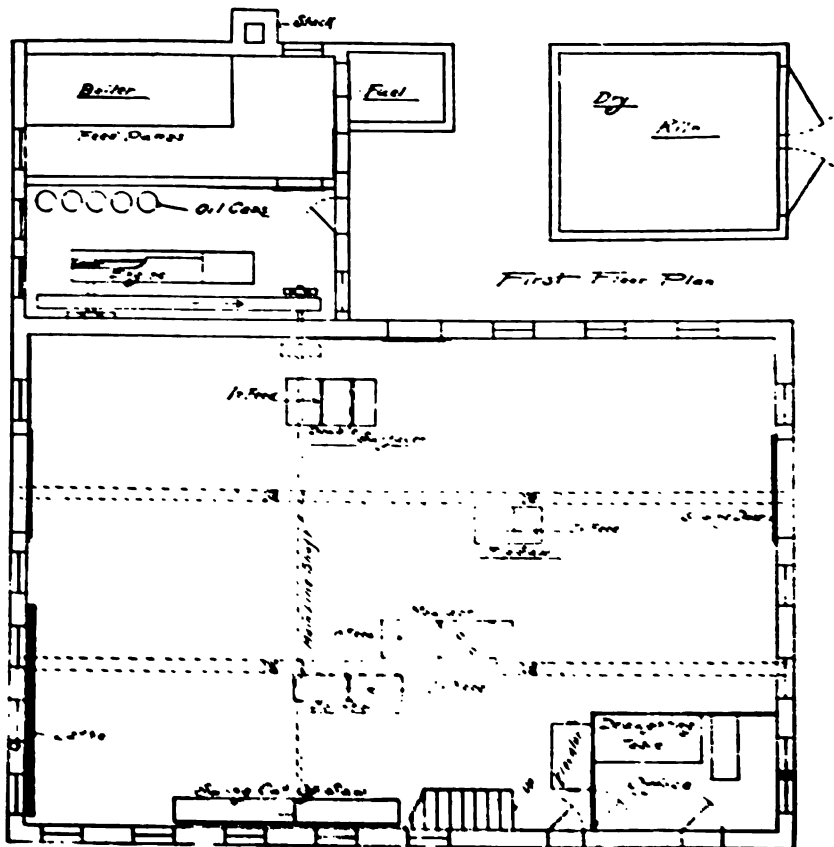
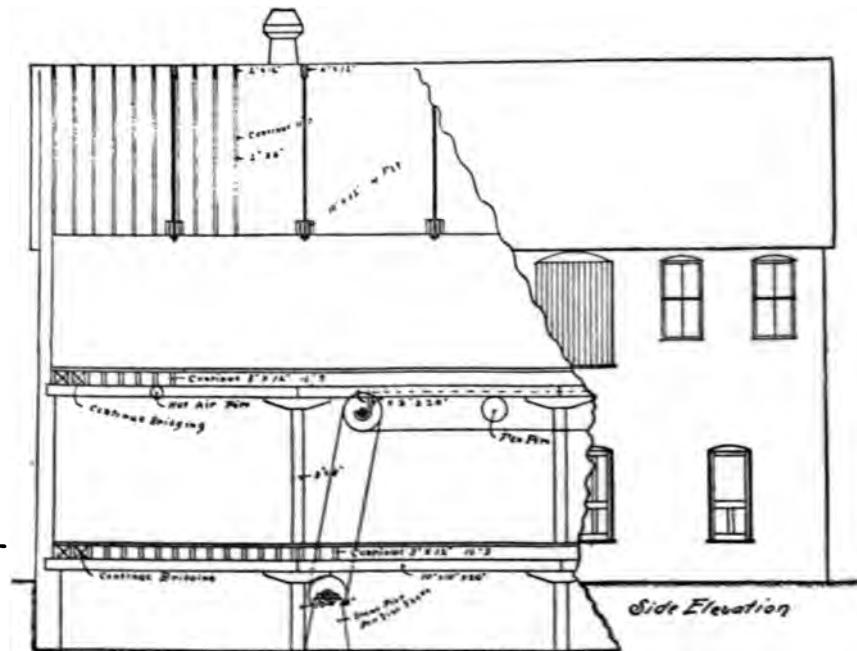
Plan of Enclosed L
Shed

EXAMPLE XII—PERSPECTIVE VIEW.

Oftentimes the type and shape of a shed must conform to the ground space, hence there are sheds which are wider at one end than at the other, and others lacking the desired length the capacity must be acquired by the width. A shed is in mind that could extend back only 50 feet, the structure running lengthwise along the street. Another shed is 150 feet long, and only 50 wide, which allowed for a piling space of 16 feet on one side, 18 on the other, with a 16-foot alley. This alley, had not the ground space been limited, would have been 22 feet wide, but as it was the ground was entirely covered. This arrangement was objectionable, but unavoidable, unless a location too far from the center of town was chosen.

In the event that the construction of an L shaped inclosed shed should be desirable, the one that was built by Barnett & Anderson, Ripon, Wis., is as good an example as could be presented. It was highly prized by Mr. Barnett, who was an excellent lumberman, and following its destruction by fire the one that replaced it, that was of different type, was less satisfactory. The shed was also praised by the traveling men of the state. The plan shows the arrangement and dimensions. The main posts were 8-inch cedar, and the balance of the frame was hemlock. As a test of the two processess a half of the alley space was cindered and the other half was planked, the latter, in the estimation of its owners, being decidedly preferable. The office was a separate building.

EXAMPLE XIII—
SIDE
ELEVATION.



EXAMPLE XIII—
FIRST
FLOOR PLAN.

Example XIII

Small Door Factory and Interior Finish Shop

The accompanying plans show the construction and arrangement of a planing mill and odd work factory adapted to towns of from 5,000 to 10,000 inhabitants, the plan having been furnished by N. A. Curtis.

The main building is 40x60 feet, of brick, two stories high, with a basement under the whole.

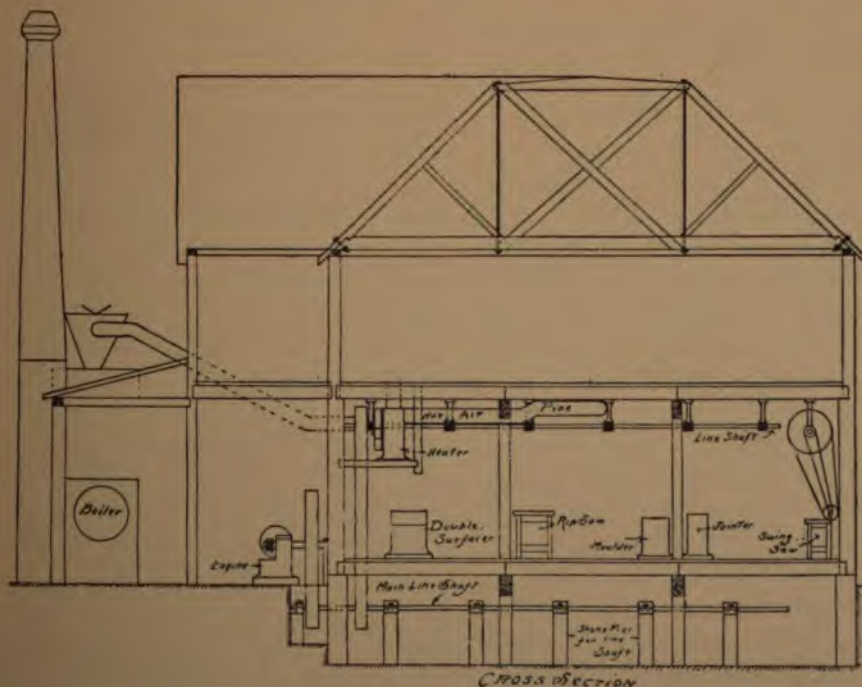
The foundation is a 24-inch wall built to stone laid in cement. The wall from first to second floor is 16 inches and from second floor to plate 12 inches. The engine and boiler room walls are 12 inches, except the partition wall, which is 8 inches, running up the full two stories, thus making the glue room above engine on second floor. The first and second floors are supported by two lines of girders running the entire length of building. The second floor has no obstructions in the way

of posts, as the roof is made self-supporting.

The dry kiln is 15x18 feet by 14 feet from sill to plate. The walls are 8 inches and it is fitted with steam coils for drying. The kiln is small but large enough for a shop of the size described, located in towns of less proportions than a city. The shaving house is located in a convenient yet safe place.

It has been endeavored to lay this plant out in a convenient manner with consideration for fire risks. The risk in this line is reduced to a minimum. The hot air system of heating is the safest and most effective and costs but little more than piping the whole building for steam. Besides, it does away with the expense and aggravation of keeping the pipes thawed out in cold weather.

The main line shaft is located in the base-



EXAMPLE XIII—CROSS SECTION.

proper fitting out of a mill with machinery is no small task and should be undertaken by a man who is a thoroughly practical machine-man, one who is capable of determining these points at a glance. Often the proprietor of a mill is heard to say, "Yes, if I had it to do over I would buy a different machine from that one. It has always been an aggravation to me."

The machinery in these plans is located with a view to convenience. The arrow points indicate the direction the machine is fed. Lumber brought in the door back of the double surfacer goes through the machine and is laid over to the rip saw or piled up convenient to it. On going through the rip saw it comes out back of the molder and within easy reach of the man running it, or is laid over to the swing cut-off saw, which is close to the jointer or the stairway to the second floor or the elevator. The latter is a small hand power affair, but large enough and strong enough to take up a factory truck loaded with door stock or door and window frame stock. The molder on first floor is an 8-inch four sided machine and answers the purpose of a flooring machine as well as for making molding. The material on reaching the second floor is taken to the foreman's bench, where he lays out the work, which goes from him to the tenoner, mortiser or variety saw, all of which are convenient to his bench. This variety of saw is put in to take the place of a universal wood worker, as its utility is greater (if the two machines cannot be had). In doing the work on the overhead everything can be done on this machine that can be done on a wood worker, and more, as it has a wide table and permits of working wider lumber on it.

The glue room, above engine, is fitted with sash and door clamps. As it is always warm better results are obtained in glued work.

The following is a complete list of machinery indicated:

First Floor

- 1 endless bed double surfacer.
- 1 self feed rip saw.
- 1 8-inch four sided molder.

- 1 18-inch jointer.
- 1 swing cut-off saw.
- 1 20-inch lathe, 16-foot bed.

Second Floor

- 1 triple-drum sander.
- 1 24-inch pony planer.
- 1 variety saw.
- 1 panel raiser.
- 1 tenoner with cope heads.
- 1 mortiser.
- 1 4-inch sash sticker.
- 1 jig saw.
- 1 36-inch band saw.
- 1 upright boring machine.
- 1 double spindle shaper.
- 1 blind slat tenoner.
- 1 relisher.

The relisher should be a combination relisher and hollow chisel mortiser, as it will be very useful in helping out on sash, blinds, etc.

The cost of the buildings, including the setting of the boiler, engine and machinery, will be about \$3,600; cost of machinery, boiler and engine, \$3,800; total, \$7,400.

Criticism on the Above Plan

From the standpoint of a fire risk, the Lumber Mutual Fire Insurance Company, of Boston, comments as follows:

"A lower rate of insurance can be obtained if the floors are 'slow burning' or 'mill constructed'; i. e., floors of matched 3 or 4-inch plank laid directly on the beams without intervening joists. (See cut herewith which will give the idea. One side is for brick, the other for frame construction.)

"It would be necessary to have four 10-foot bays, or five 8-foot bays instead of three 13 1-3-foot bays as shown. Posts can be 20 feet apart the other way, the same as shown. This method costs no more than the joisted. A foot in external height is saved in each story with the same internal height 'in the clear.'

"This is the universal method in cotton and woolen mills, is the up-to-date factory construction in the east, and gives a more substantial floor and also one that is slow burning. A fire will char a surface only about an inch.

fire for hours without allowing it to pass into the stories above or below. Belt holes form a ready path for fire to spread quickly.

fire for hours without allowing it to pass into the stories above or below. Belt holes form a ready path for fire to spread quickly.

"If the basement be low and dark no shafting should be put there—'out of sight, out of mind'—and a higher rate of insurance will be charged if it be placed there. Besides this the basement is almost certain to become a catch-all for refuse. The insurance people desire shafting overhead and in plain sight.

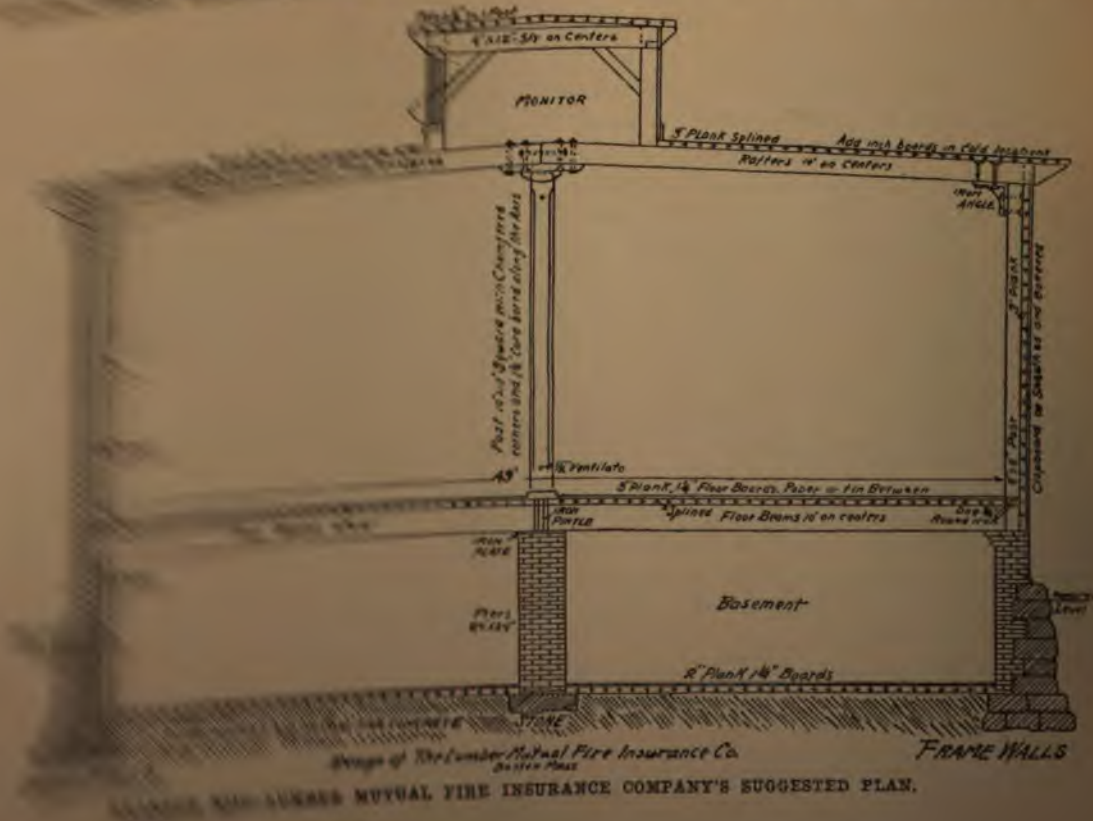
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"We would make the mill two stories without any basement and would put a line shafting overhead in each story and extend the belt to the second story line up outside the brick mill in a brick beltway arising out of the engine house. We would then be down to the machinery, and would have no hole of any kind in the floors.

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"While a trussed roof may be convenient since it does away with the posts, it is a fire trap, impossible to keep clean, aids the spread

"While a trussed roof may be convenient since it does away with the posts, it is a fire trap, impossible to keep clean, aids the spread



Design of The Lumber Mutual Fire Insurance Co.
 BOSTON MASS
 LUMBER MUTUAL FIRE INSURANCE COMPANY'S SUGGESTED PLAN.

of fire and yields quickly to a fire. Walls should be ledged out to bear the beams and floor plank.

"The shaving vault should be located beside the stack shown; i. e., at right angles to boiler, and not in front of it, where, if the boiler puffs out, as they do at times, it would empty its burning contents into the vault. Boiler and

shaving vault should be entirely of brick and iron, with standard fire doors between them and from boiler to engine room. There should be an automatic cutout in shaving pipe between cyclone and mill. Shaving vault floor had better be about 2 feet above boiler room floor, so that a man can shovel out of it without breaking his back."

Example XIV

The Shannon Shed

Shannon Lumber Company, Shannon, Ill., 80x160 feet; outside poles 20 feet, the next row 25, and the middle rows 30, all set in cement; alley, 16 feet, running lengthwise with three alleys running crosswise which intersect it; all the alleys planked with elm; sash and door room, 14x24; cement room, 12x16; patent lime house in which lime is carried in bulk, 8x16; barn for three horses, and room for two and a half tons of hay, 16x16; room for storing mold-

ing on end, 16x24; office, 16x24, all these under one roof. The unloading deck occupies 18 feet next to the track, and an illustration showing it appears in Chapter XXV. The upper decks are floored with cull birch, a space being left between the boards to admit air under the piles; by opening the doors in the rear through which the lumber is shoved from the cars that side of the shed is practically minus a wall, and for additional ventilation space is left between



EXAMPLE XIV—EXTERIOR VIEW.

If you burn an inch off of each side and of the 3-inch joists of a floor the floor will stay the same way, while the 10x12-inch beams will still be able to hold up the weight until repairs are made.

"These floors should have a 1-inch top layer of a lagging floor of hardwood, with builders' nails between. The roof should be flat and feature similar mill construction, covered with gravel and gravel. The roof plank can be 3-inch, according to span and as a heavy weight of snow must be borne. The bottom floor, be it the basement floor, should be on the ground.

"The elevator and the stairs
brick tower and cut off by a
door, or they can be entirely

"We very much doubt if putting the shafting beneath the belting up through them. It is constructed floors without any

EXAMPLE XIV—INTERIOR.

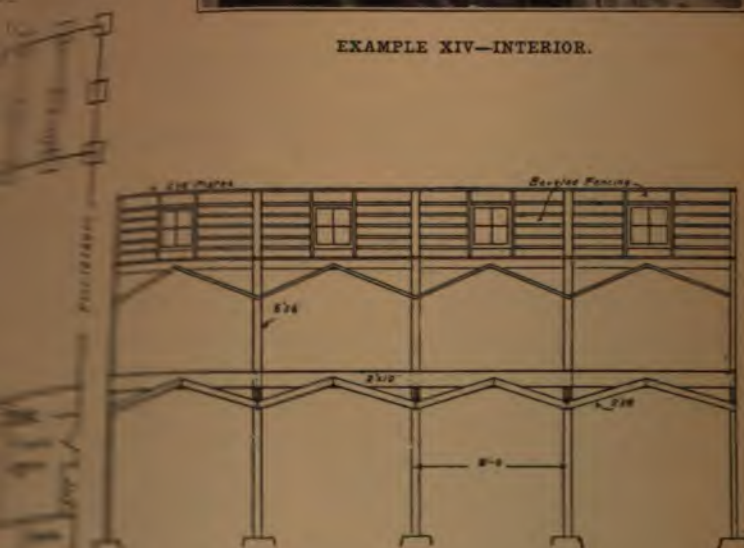
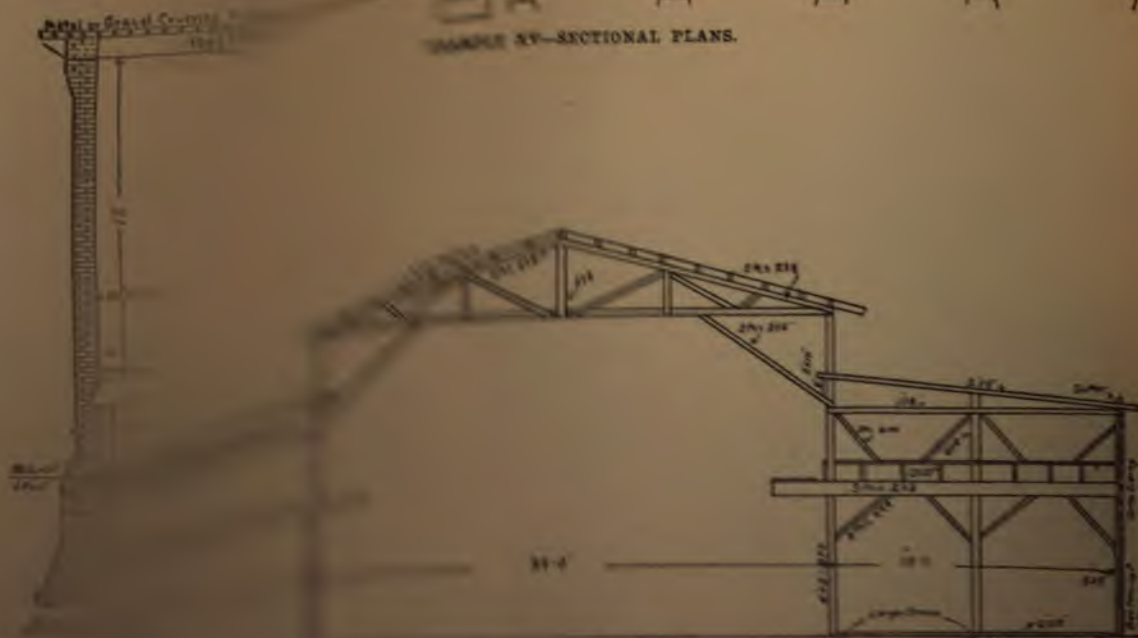


TABLE XV—SECTIONAL PLANS.



SECTION BY PLAN OF FRONT ELEVATION.

Example XV

Shed With Wide Alley

This shed, the property of the Fullerton Lumber Company, Oakland, Iowa, is 70x176 feet. The side posts are 14 feet, and at the highest point it is 34 feet. From center to center the bins are nine feet wide. The width of the alley—34 feet—cannot be duplicated many times in the retail lumber world, 25 feet being considered wide. The sills are 2x6s on the wall line and lengthwise of the piling space, and upon these the 6x6 posts are set.

The shed has no solid foundations, large stones being laid under the posts where such treatment would answer, elsewhere piers being used. Owing to the nature of the ground difficulties were encountered in building the shed, as under it there is a slough that requires a 3-foot sewer pipe to carry the water, and a

fill of 12 feet for a distance of 60 feet was necessary, the dip in the ground extending 60 feet still farther—hence the piers.

On each side, for four feet, beveled fencing is used, and also on the sides of the drop in the roof, for ventilation. The shed stands north and south, and on the east side in the opinion of the builders instead of using beveled flooring four feet it should have extended to the roof.

The office is 14x14. In the rear of the office is a room, 8x18 feet, for the storage and display of fancy doors, and in the rear of this room is the wareroom, 18x32 feet.

Lime and cement are not stored in the building.



EXAMPLE XV—PERSPECTIVE VIEW.

Example XVI

A Modern Pole Shed

This is a good example of the pole shed. Fourteen-foot boards are used on the 16-foot side, leaving for ventilation a 2-foot opening along the bottom. A cupola might be a valuable addition, notwithstanding the ventilation is such that ship lap that was piled flat for five years was found to be in perfect condition.

It may occur to the handler of lumber that this is a commodious shed for the money, its cost being not far from \$900.00. In size it is 80x156 feet, with three alleys 16 feet each. There are two outside bents and four inside, each 20 feet deep. As illustrated by the interior view, the system of framing is very simple. The rafters are cut away to fit over the plates to which they are securely spiked, this system holding the roof in place in case of a heavy wind sweeping under it. The poles are set in holes five feet deep, the upper three feet filled with cement. The roof is of ordinary felt, the strip running up and down, and as it stood without showing sag under 10 inches of wet snow no fear is entertained that any fall of snow will affect it

for the worse. The windows in the two ends are irregular in size, having been selected from the "bull pen" of a sash and door house, bought cheap, and can be tilted to admit air.

Along the opposite side of the shed shown there is a railroad track, and in addition to the large doors there are small ones which shut tightly through which the material from the cars may be unloaded. Brick is stored in one corner of the shed and shingles in one end. The foundation sticks for the shingles are short, which permits of their being laid away



EXAMPLE XVI— EXTERIOR VIEW.



INTERIOR VIEW.

as the pile diminishes, thus giving clear space to the teams to back up to those remaining.

The owners of this shed, the Loomans Lumber Company (formerly Caldwell & Loomans), Waupun, Wis., are not advocates of the upper deck, hence it is not used except in a very small space, the idea carried out being that one man should be able to load quickly. The office is in another building.

So inexpensive is the shed that, with ample room, without drawing heavily on the purse strings of the

dealer, it can be extended in length to accommodate a stock of any size. It must be admitted that it is a decidedly common sense shed.

Specifications

48 20-ft. 5-in. poles.
20 22-ft. 5-in. poles.
20 25-ft. 5-in. poles.
24 2 x 10 20 plates, No. 1 hemlock—
800 ft.
84 2 x 10 16 plates, No. 1 hemlock—
2,240 ft.

310 2 x 6 18 rafters, No. 1 hemlock—
5,580 ft.
154 2 x 6 10 rafters, No. 1 hemlock—
1,540 ft.
2,000 ft. 2 x 6 No. 2 hemlock girts and
braces at top of posts.
14,800 ft. No. 3 hemlock roofing.
600 ft. rafter ties 2 x 2's, No. 2 pine.
150 sq. felt roof.
7,600 ft. 12-in. com. bds.
200 ft. barn door track.
16 windows 9 x 14, 12 lts.

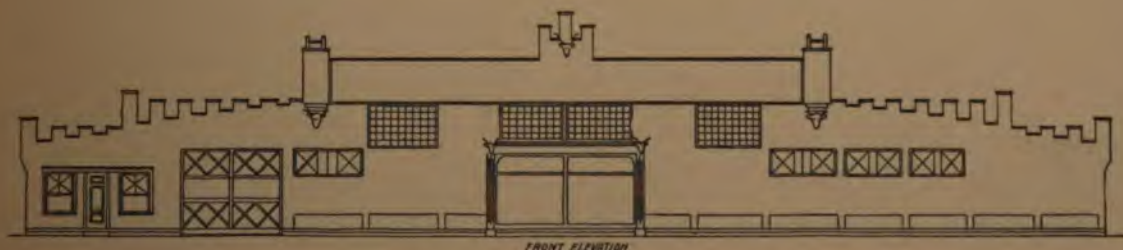
Example XVII

A Unique Design

For uniqueness, this shed, built by the Propst Lumber Company, Paris, Ill., will command the interest of every shed user. It has features peculiarly its own, notably its lowness as compared with its size, its system of ventilation and its single entrance notwithstanding there are three alleys.

The building is 147x155 feet, the foundation is vitrified brick laid in cement, and the frame

throughout is of oak. It is covered with 4-inch drop siding, the roof sheeted with 4-inch flooring and covered with a composition material. The second deck is only seven feet above the ground, which allows the upper decks to be much more easily reached than ordinarily. The bins are five feet wide. In the center of the shed, on the third deck, will be piled lumber that is slow of sale, such as chestnut, red



EXAMPLE XVII—FRONT ELEVATION OF PROPST LUMBER COMPANY'S SHED.

ar and cherry. The shed will house a \$30,- stock. The interior is whitewashed, and inside the color is a bright yellow trimmed with white.

few sheds are so amply provided for the mission of air. The openings, as seen in the plans, are on the four sides of the building, and are covered with extra heavy wire netting. In addition, on the two sides and rear are doors which can be opened and closed. To secure upward draft there are 20 skylights which may be open or shut as the demand may be. Another feature in the ventilation is the elevation of all the piles a foot high from the ground, thus permitting the air to circulate freely under them. In a sense the lumber will be suspended in air, it being possible to see over the entire surface of the shed under the piles except as the sight may be obstructed by the bearings on which the piles rest. The interior, plaster and lime rooms are two and a half feet above the ground, and under this space is inclosed. A clean sweep of air in every direction and everywhere is the intention. An inclosed shed could be better ventilated.

On one of the second decks is fitted up a room 20x20 feet, in which are installed a rip saw, cut off saw and a small band saw, driven by an electric motor. The stables, as it will be observed, are under the same roof. The molding is stored on end. In the building there are seven telephone instruments, one in the bookkeeper's room, one in the drawing room, one in the estimator's room, one in the private office and three in the shed. The sign on the comb of the building is 6x147 feet. The large plate windows in front are used for the display of columns, spindles, base and head blocks, interior finish, paint, hardware and such other articles as it may be desired to exhibit. The office is heated by furnace, and the offices and shed lighted by electricity. The turreted front is suggestive of an old time war structure, and Mr. Propst says that the two cannons are to protect his customers; that once inside the shed they are saved! A feature that most dealers would think would hazard the interests of the business are cards prominently displayed on which are plainly marked the price of every description of lumber.



EXAMPLE XVIII—FRAMEWORK OF J. A. SMITH SHED AT OSAGE, IOWA.



EXAMPLE XVIII—
PERSPECTIVE VIEW—
RIGHT FRONT.

INTERIOR VIEW.

PERSPECTIVE VIEW—
LEFT FRONT.



Example XVIII

A Well Ventilated Enclosed Shed

Mr. A. Smith is one of the best of shed builders, due to the fact that from the start he has used the correct method, has built several and has sought to improve, always making his last shed the best.

It is doubtful if better ventilated inclosed sheds can be found than his. In them is stored the lumber he receives, that which goes in green, when properly stuck, coming out in good condition, it is claimed, the secret,—the secret there be—being that his sheds are so constructed as to admit all the air possible. Too, he understands that in order for the air to pass through the lumber it must be admitted at the rear of the piles, and that once admitted it must find egress.

The shed illustrated is at Lake City, Minn., and is 54x180 feet. The alley is 21 feet wide. The bins are 7 and 6½ feet high respectively, 10 feet from center to center, leaving them 1 foot and 2 inches in the clear. All the studs are 2x4 except that which is next to the alley, which is 2x6. The framing material is white hemlock. The rafters are 2x4 and the bents are 4 feet wide. Under the frame in every direction every 4½ feet there is a cross pier. The outside posts are 14 feet apart inside 28, and from the alley floor to the top of the building the height is 36 feet. The cost of the shed approximately was \$2,500. It is the way of ventilating these sheds, however, which is of prime interest. No matter how carefully a shed may be constructed, what the foundation may be or how much it may cost, if not properly ventilated it is a poor

shed. In the cupola there are 8x10, 4-light sash, the openings occupying about half the space the entire length of the shed. During the months when there is no danger from snow these windows are never closed. The partition between the timber shed shown on the left and the shed proper is of strips with spaces between them, thus admitting air freely. Were it entirely open between the two apartments there could no harm come from it.

On the opposite side of the shed there are doors on rollers, 3x10 feet, the height of the doors permitting the opening to extend three feet above the foundation line of the upper deck. When the doors are not closed there is this space, ten feet high, along the side of the shed that is half open. Thus it will be observed that these sheds have won the excellent reputation they have from the fact that they are about as open as a large inclosed shed can well be built.

The skeleton frame represents Mr. Smith's shed at Osage, Iowa, when in course of construction, and shows to a considerable extent the system of framing. The bents for the sides were all made before one of them was put in place. Several of the sheds belonging to this dealer were built by J. C. Clary, a professional shed builder, whose work is so distinctive that once seen it is anywhere recognized at a glance. In this frame, on the left, it will be observed that there are timber pockets, an idea that Mr. Smith has outgrown, as illustrated by his Lake City shed.

Example XIX**A Good One-Man Type**

This shed, the property of the Beebe Lumber Company, Hampton, Iowa, is a type that is common in some sections. It is 22x186 feet, is not floored, the lumber resting on bearings of its own, and as a consequence the frame may be light. When desired it is really an open shed, as the front is all doors, with several in the rear, and in case of a driving storm it can be tightly closed. In some sheds of this type the doors are on rollers, which may be an advantage when they have to contend with a lively breeze and plainly a disadvantage when it is necessary to admit all the air possible into the shed.

The outside posts are 10 feet, the low space rendering it easy to place lumber in the shed and equally easy to take it from it when



EXAMPLE XIX—SECTIONAL VIEW OF FRAMING.



EXAMPLE XIX—PERSPECTIVE VIEW.

delivering. The inside space may be subdivided in a way to accommodate the items carried in stock. The builder could have made the shed high enough for a second deck, but in such an event it would lose its present characteristics as a type, namely, cheap construction and an arrangement that permits the lumber to be easily handled. It is an excellent shed for a one man yard, as in no capacity around it are the services of two men necessarily required. Overhead in the building light stuff that is not often called for may be stored provided there is lack of room below.

The ingenuity of the yard man should be exercised in attaching to the doors some device that will hold them firmly when opened, and the wise lumberman might find it to his advantage to bring this device into play most of the time. A yard man who has one of these sheds which stands east and west says he has not found it necessary four times a year to close the doors.

In the front end of the shed which the camera does not show is located the office, and back of that the sash and door room. The expense of the entire layout was about \$500.

Example XX

The Long-Bell Specification

It is highly probable that the Long-Bell Lumber Company is interested in not far from 100 yards, possibly more. The pet shed of the company is the wide, open, double or umbrella shed, as it is known in different sections. The specifications which are followed in building these sheds are given below. The cost for carpenter work in building the shed

is approximately \$175, and the hardware costs \$25.

Masonry—The foundation shall be of stone or bricks, as best suits the conditions at the point where the shed is to be erected, and shall be built in a good, substantial manner. The walls and piers should be at least 18 inches wide at the bottom, reduced to 12 inches at



CROSS SECTION OF A SHED OF THE LONG-BELL LUMBER COMPANY.

braces of 2x4 and fasten them to the outer ends of the first, third, fifth etc. of the 2x6. To support the rafters for the hood use 2x4 plates on these supports notched into the supports or doubled, toenailing the rafters for the hood to this plate, and spike to the main rafters.

Cut the cross pieces underneath the upper bearings from post to post diagonally across the shed, beginning at the corner and center. These should be put in closely and well spiked to prevent the shed from leaning endwise; also brace on each of the two longest posts 1x6 braces, shown on dotted lines on the side elevation of the drawing. Also brace with 2x4 from the lower to the upper deck, these to be flush with posts, closely fitted and well nailed at the bottom and top.

Make the walks of 2x8, laid two inches apart, fastened to 2x6 supports. Access to the walk may be provided by ladders at either or both ends, fastened to the ends of the shed, or by light ladders provided for this purpose.

Roof—For a shingled roof lay 4-inch sheathing on the rafters fastened with eightpenny nails at each rafter, leaving 4-inch space between the boards; lay the shingles four and a half inches to the weather, care being taken to break joints on each course. For prepared roofing cover the rafters with 1x8 shiplap, or

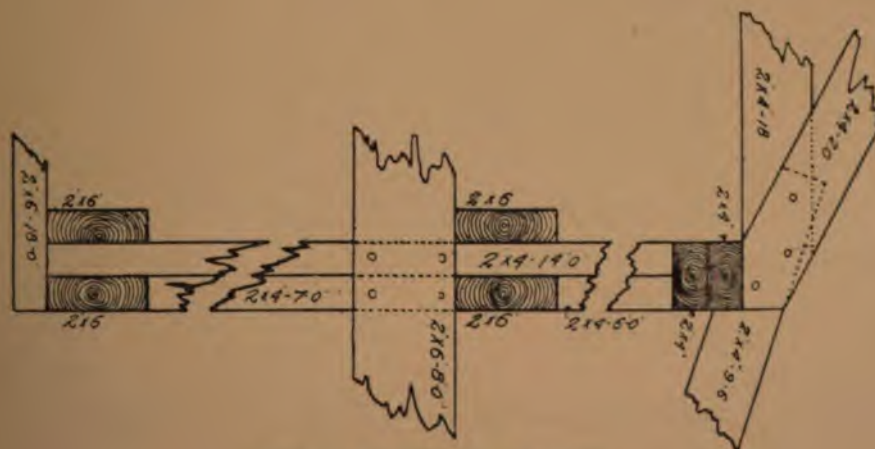
D&M; fasten well at every rafter with eightpenny nails; over this lay any standard prepared roofing, coating all the joints with cement, and fasten down with roofing nails and tins.

Siding—For the front end of the shed use 6-inch drop. It will be necessary to put a 2x4 studding between the posts, toenail to the 2x4 tie at the bottom of the shed, also to the center and upper ties and to the rafters. For the rear end of the shed use 1x12 boxing put on vertically, nail with three eightpenny nails at the bottoms, centers and tops and batten all cracks with $\frac{1}{2}$ -3 battens.

Painting—Paint the ends of the sheds with two coats of white lead; thoroughly mix and brush well. For the roof paint with a good quality of roof paint well brushed into the shingles.

Lumber Bill for Shed 36x100

168 pieces 2 x 6—18	No. 1, S&E bearings.
84 pieces 2 x 4—18	No. 1, S&E plates.
46 pieces 2 x 4—14	No. 1, S&E posts.
46 pieces 2 x 4—16	No. 1, S&E posts.
46 pieces 2 x 4—18	No. 1, S&E posts.
46 pieces 2 x 4—20	No. 1, S&E posts.
46 pieces 2 x 4—22	No. 1, S&E (or 14 ft.) posts.
276 pieces 2 x 4—7	No. 1, S&E for stiffening posts.



EXAMPLE XX—DETAIL OF FRAME.

40 pieces 2 x 4—12 cross braces under per deck.	40 pieces 2 x 4—12 cross braces under per deck.
48 pieces 2 x 8—18 floor for walk.	48 pieces 2 x 8—18 floor for walk.
22 pieces 1 x 6—12 braces.	22 pieces 1 x 6—12 braces.
1,500 feet 1 x 4 sheathing.	1,500 feet 1 x 4 sheathing.
30,000 extra "A" red cedar shingles.	30,000 extra "A" red cedar shingles.
1,000 feet drop siding for the front end shed.	1,000 feet drop siding for the front end shed.
800 feet 1 x 12 boxing for the rear end shed.	800 feet 1 x 12 boxing for the rear end shed.
800 feet 1 x 3 battens for the rear end shed.	800 feet 1 x 3 battens for the rear end shed.

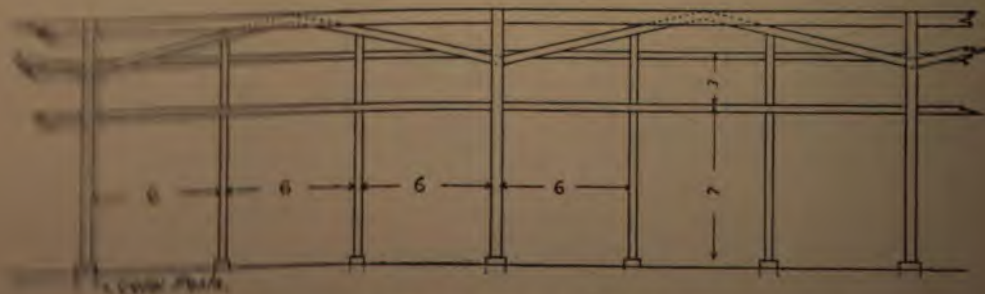
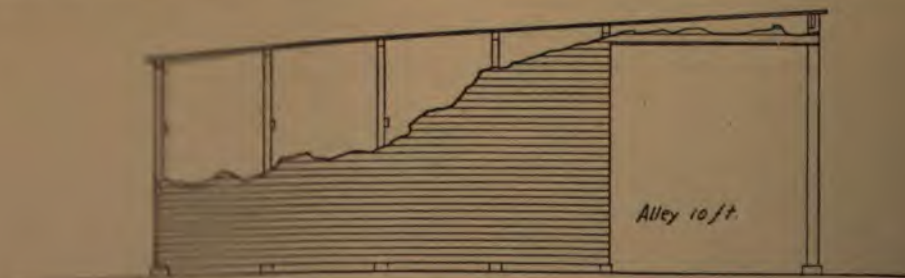
Example XXI

A Good Low-Cost Style

This cheap, easily constructed, ingenious shed evolved it looks easy enough, but the conception of a contractor and a farmer—A. Spears—who for 25 years followed the lumber trade in Grand Rapids, Mich., the shed which he is now selling lumber at.

type of shed, such a one as had not been brought to his notice, and so built this one.

The roof covering the alley is simply an extension of the shed roof proper, and at times is a protection against both sun and storms. The shed is a double decker, upper deck only four feet high, however,



EXAMPLE XXI—END AND SECTIONAL VIEW OF THE C. A. SPEARS SHED AT GRAND RAPIDS, MICH.

divisible, could be omitted. The posts are on cedar blocks, and only the lumber on the upper deck bears on the frame of the shed. The front posts are 6x6, the others 4x4. The building is covered with

gravel. The shed is 200 feet long and Mr. Spears says it can be built for \$2.50 a running foot.

With some modifications this style of shed would be admirably adapted for coal.

Example XXII

Double Deck Open Shed

In the details of construction the open shed might make some changes in this design. In this shed, the property of Townsend & Company, Hampton, Iowa, but on general principles the dealer who built this shed is liable to call it about right. It is a shed that is rapidly growing in favor, the advantage being that the lumber never gets out of air, and another that there need be

no waste room, as the lumber of different lengths can be piled end to end. There are yard men who would seriously object to the upper deck, but this is a matter of taste. With the upper deck omitted it would be advisable to build lower. The outside posts are 14 feet, and those in the center 18 feet. The lower bins are 8 feet high, and the upper ones 6 feet. The roof boards are hemlock shiplap, covered



EXAMPLE XXII—GENERAL PERSPECTIVE VIEW.

with ready roofing. The hood is 10 feet wide, supported by braces as shown. The bins of the upper deck and a portion of those below are 9 feet from center to center, the balance of them $4\frac{1}{2}$ feet. The platform is $3\frac{1}{2}$ feet wide, with the guard rail that is so often omitted in sheds which are inappropriately termed complete. The capacity of the shed is 385,000 feet, with the lumber piled within a foot of the top of the bins; as lumber is ordinarily piled it will easily store 250,000. In size it is 33x100 feet, and the material of which it was constructed cost \$556.38.

The bill of material, excepting the nails and the stone for the foundation, is as follows:

5 pieces 2 x 10—18 hemlock.
40 pieces 2 x 10—10 hemlock.
24 pieces 2 x 8—14 hemlock.
4 pieces 2 x 8—16 hemlock.
33 pieces 4 x 4—18 hemlock.
22 pieces 4 x 4—16 hemlock.
44 pieces 4 x 4—14 hemlock.

120 pieces 2 x 6—18 hemlock.
36 pieces 2 x 4—14 hemlock.
9 pieces 2 x 6—22 hemlock.
10 pieces 2 x 6—12 hemlock.
27 pieces 2 x 6—20 hemlock.
60 pieces 2 x 8—18 hemlock.
8 pieces 2 x 8—20 hemlock.
20 pieces 2 x 4—16 hemlock.
20 pieces 2 x 4—19 hemlock.
2 pieces 2 x 4—20 hemlock.
75 pieces 2 x 4—8 hemlock.
26 pieces 2 x 4—12 hemlock.
32 pieces 2 x 4—6 hemlock.
28 pieces 2 x 6—16 hemlock.
34 pieces 2 x 6—10 hemlock.
5,800 feet 8-inch No. 2, hemlock shiplap
1,450 feet 4-inch No. 2 drop siding.
24 pieces 1 x 6—16 hemlock.
10 pieces 1 x 6—12 hemlock.
8 pieces 1 x 4—18 No. 2 hemlock
S1S.
8 pieces 1 x 6—16 No. 2 hemlock
S1S.
112 feet $2\frac{1}{4}$ -inch cove.
112 feet $3\frac{1}{4}$ -inch crown.
8 feet 1 x 8—16 No. 2 S1S.



EXAMPLE XXIII—SHED OF W. P. RHODES, SAVANNA, ILL.

Example XXIII

A Semi-Enclosed Shed

There are sheds which may be called crosses between the open and inclosed ones, the example shown, built by W. P. Rhodes, Savanna, Ill., being one of them. Another style of construction, not infrequently seen, leaves the lower story open and the upper one inclosed. Every dealer who builds a shed ascribes to it some particular virtue which another yard man may be unable to discover; hence the continued multiplication of the various types. It is with lumber sheds as it is with residences—were the tastes of all the same the monotony would become tiresome.

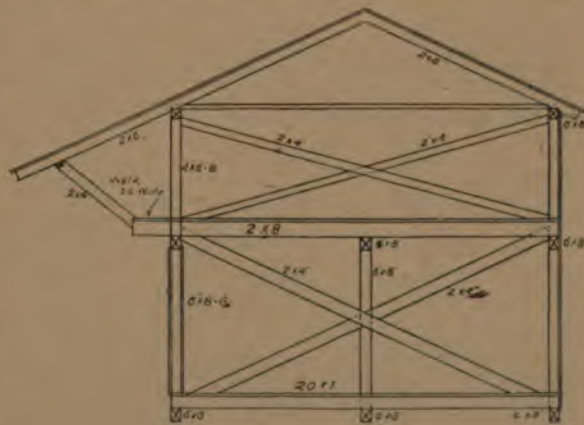
The construction of this shed is so simple that any competent carpenter would be able to duplicate it from an inspection of the photograph, to say nothing of the cross section which is also presented. In size it is 20x112, and 16 feet high. If Mr. Rhodes were building again he would rest the lower joist on piers instead of on the sills, and thus prevent the weight of the lumber from pulling the frame out of true. He would also have a few more inches of space between the platform outside of the posts and the roof.

In both stories the posts are 8 feet apart. For the upper floor inch-strips 4 inches wide, of cheap lumber, all lengths, were used, with an inch space between them, and 2x4 stuff for the lower floor. The sides and roof are covered with No. 4 boards, the best being selected for the sides. The roofing is asbestos paper. In the construction of the shed odds and ends, some of them being material that was unsalable, were used. In the end next to the office is a ware room for sash and doors. The shed

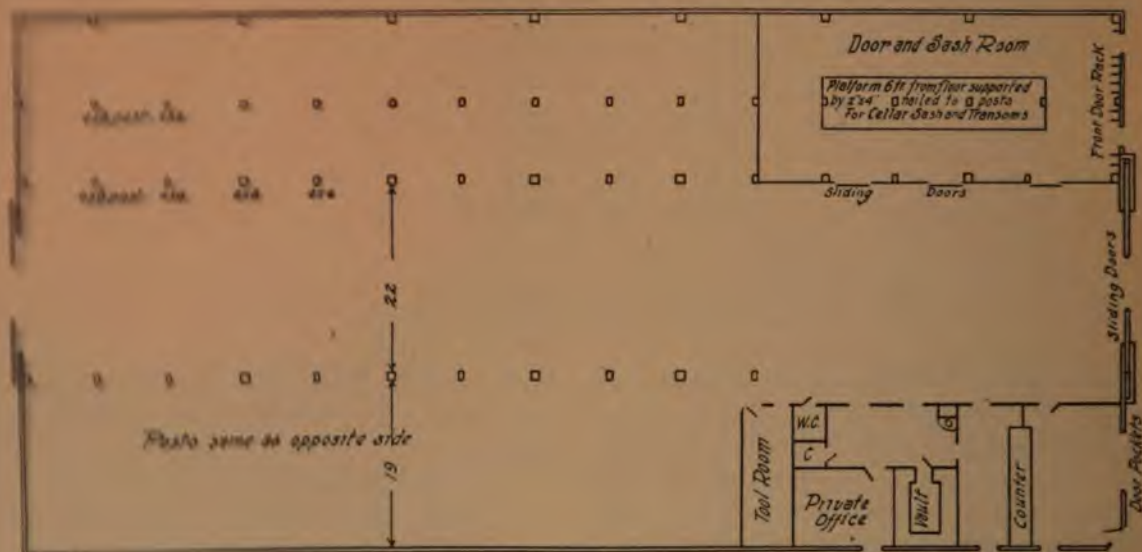
doors are hung with barn-door rollers, on an iron track, a half of them rolling inside the posts.

Bill of Lumber

- 3 sills, 6 x 8—112, for upper floor.
- 3 sills, 6 x 8—112, for lower floor.
- 14 posts, 4 x 6—8, for upper floor.
- 14 posts, 6 x 8—8, for lower floor.
- 50 joists, 2 x 8—20, for lower floor.
- 25 joists, 2 x 8—22, for upper floor.
- 26 joists, 2 x 8—20, for upper floor.
- 2 plates, 6 x 6—112.
- 1 plate, 4 x 4—112, for center.
- 52 rafters, 2 x 6—12, for north side.
- 52 rafters, 2 x 6—12, for south side.
- 52 rafters, 2 x 6—10, for projection.
- 3,300 feet of sheathing, for roof.
- 2,100 feet of sheathing, for sides.



Lumber Shed Construction



EXAMPLE XXIV—FLOOR PLAN OF THE KALBACH SHED.



EXAMPLE XXIV—PERSPECTIVE VIEW OF THE SHED OF JOHN A. & GEORGE KALBACH.

Example XXIV

A Very Complete Shed

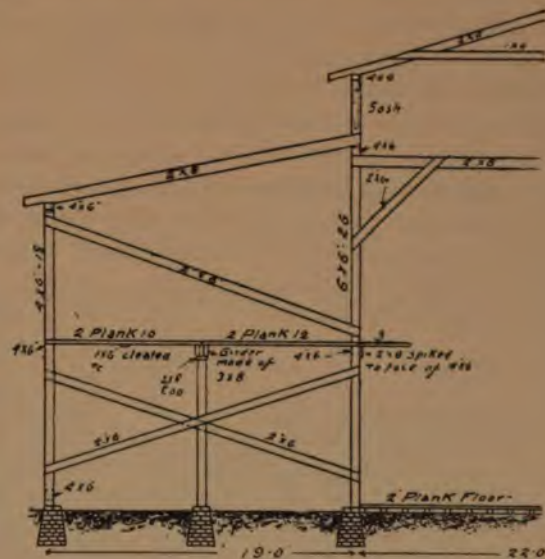
In many respects it is doubtful if there is a more complete shed than the one built by John A. & George Kalbach, Oskaloosa, Iowa. In a shed way it is the culmination of a long and successful business experience, and when planning it every pains was taken that no feature of convenience should be omitted. It will be observed that outside of the alley only half of the space below is devoted to lumber proper. There is an elegant suite of offices, and a sash and door room 19x40 feet. The doors leading from the alley into this room close automatically—merely push the button and they slowly shut. There is method everywhere. In the tool room there is a nail for every tool, with the name of the tool inscribed above it, the latter as a means of readily knowing whether a tool is gone, and if so which one it is. Over the office there are a harness room and a furnished room for an employee of the yard.

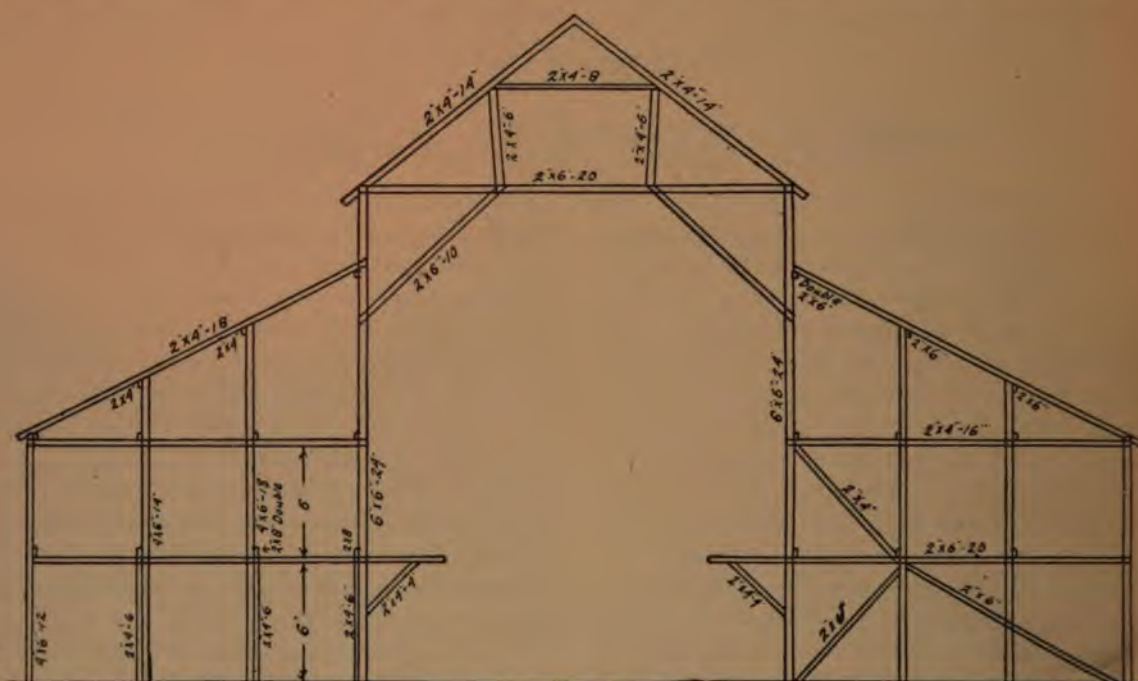
The upper decks are floored, and throughout the shed inside is painted white. For the convenience of passing from one upper deck to the one opposite there are two bridges, 40 feet from either end, made higher than the platform to admit of high loads passing under them. The bridges are made of light material, though amply strong, and are called very convenient.

The alley is 22 feet wide and planked with 2-inch hemlock, resting on 2x4 oak dimension, laid 2 feet apart, bedded in 8 inches of ashes, these latter expected to add durability to the dimension and plank. The planks are 2x10-16

and 2x10-6, the different lengths laid alternately, which leaves a 10-foot strip in the middle, where most of the travel is, without joint.

The piers for the 4x6-18 and the 6x6-26 are





EXAMPLE XXVII—CONSTRUCTION OF THE MCGREGOR BROS. & CO. SHED.



EXAMPLE XXVII—PERSPECTIVE VIEW.

Example XXVII

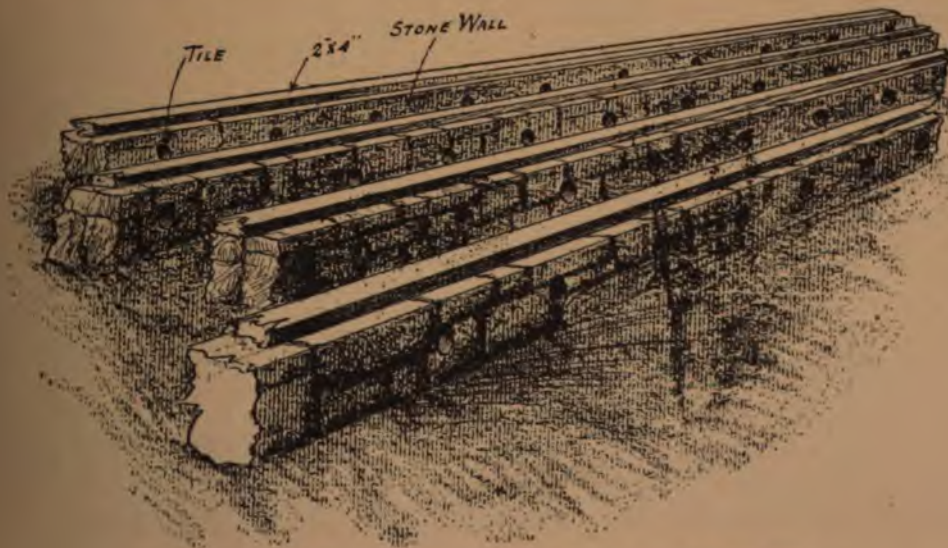
Shed with Ventilating Foundation

The distinguishing features of this shed, located at Rennville, Minn., and owned by McGregor Bros. & Co., are its foundation and the arrangement of the side doors for ventilation. The bins are 16 feet deep, 9 feet from center to center, and under the bins on both sides, running lengthwise, are three solid stone walls, a foot wide at the top (making four with the outer wall), and set at equal distance in these walls is 6-inch sewer pipe, for the purpose of admitting air. It will be seen that by this plan the air is distributed evenly under the lumber.

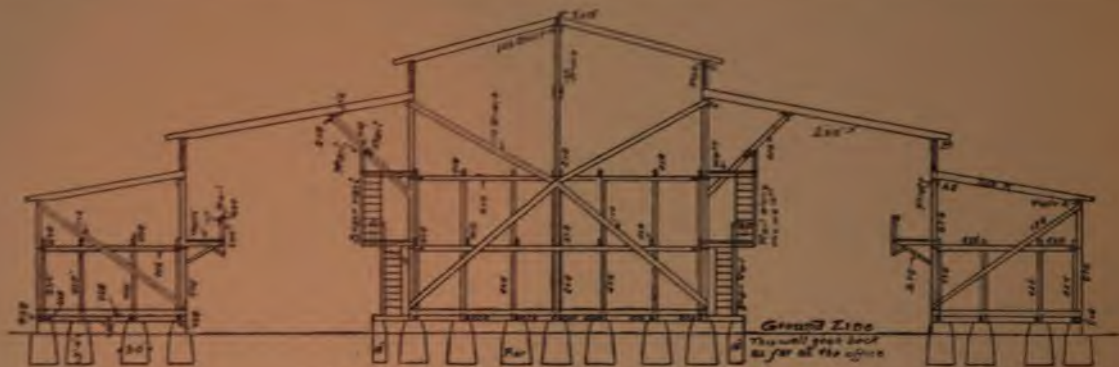
To every bin there is an outside door, 3 feet 8 inches wide, and in length reaching to the cornice. These doors are hung in threes, and all, when closed, lock automatically. To prevent the doors from binding at the top when operated there is only one roller to the door.

Outside there is a bar extending lengthwise which is designed to prevent the wind from straining the doors, or blowing them from their place. Without particularly hurrying, one of the yard men closed and locked all the side doors of the shed in a minute and a half. This arrangement of doors is highly worthy of imitation by shed builders who seek ventilation in this way. Not infrequently doors and windows are so poorly arranged that the opening and shutting of them are neglected.

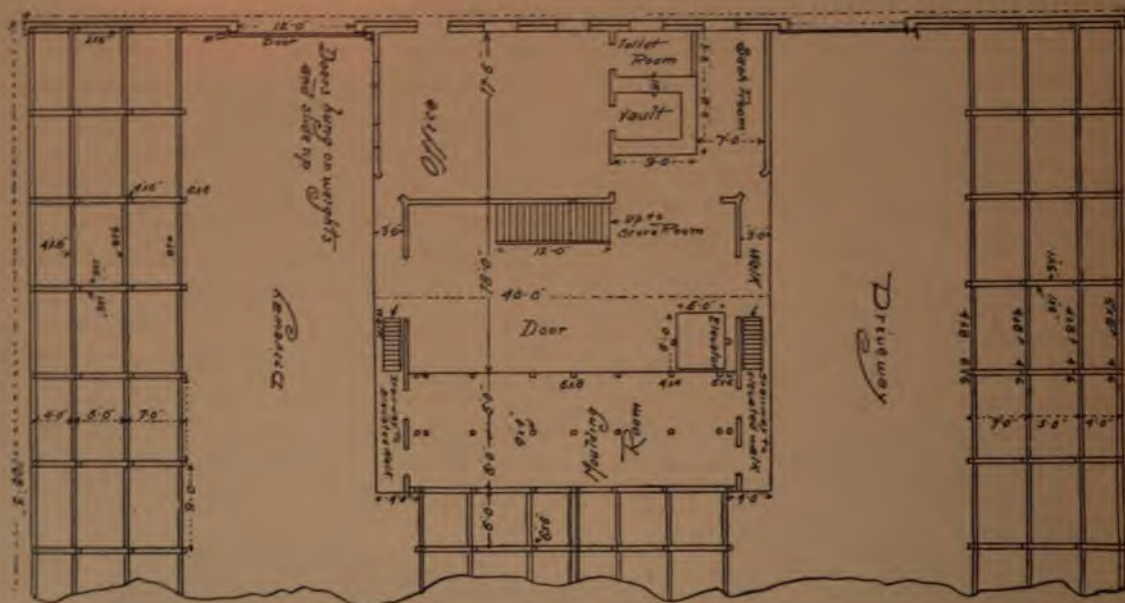
This shed is 52x150 feet, the alley 20 feet wide. There are three decks, the upper one used for window frames in the knockdown and other light material. The molding is stored on end. The cost of the shed was \$2,300. The pitch of the roof is such that the whole would admit of being covered with shingles.



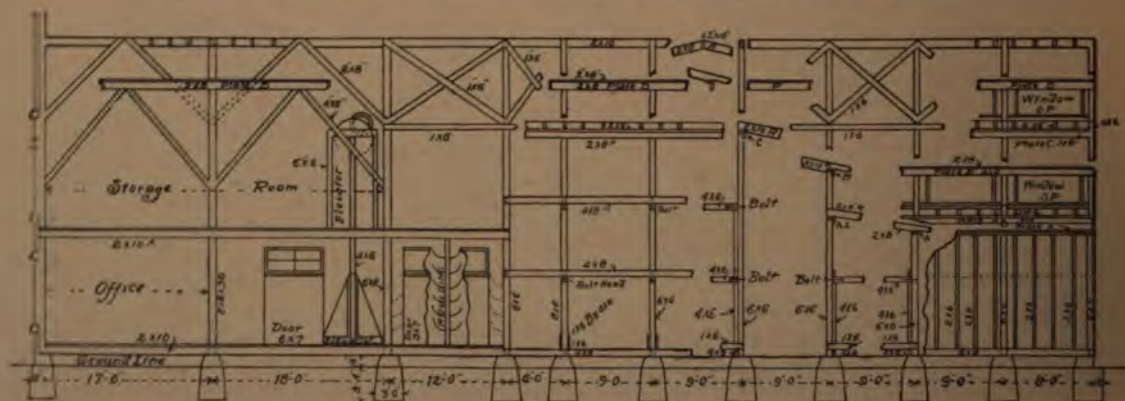
SYSTEM OF VENTILATION IN THE MCGREGOR BROS. & CO. SHED.



EXAMPLE XXVIII—PLAN OF FRONT END OF SHED.



EXAMPLE XXVIII—CROSS SECTION, SHOWING FRAMING AND PLAN OF OFFICE.



EXAMPLE XXVIII—SIDE ELEVATION, SHOWING FRAMING.

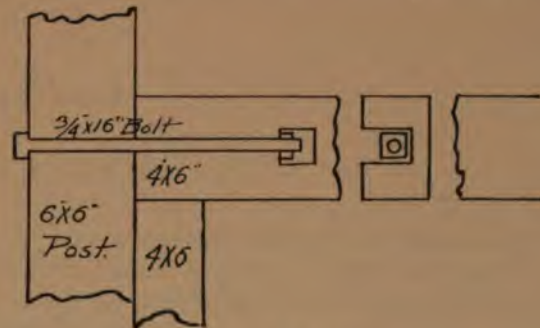
Example XXVIII

A Shed with Brick Front

This shed, located in Hutchinson, Minn., and owned by the Stearns Lumber Company, is regarded by E. J. Stearns, president of the company, as an excellent type. It surely is ornamental, as it was thought it was required to be, located as it is on the principal street not far from the center of the town. No pains was spared in the excellence of the construction, and the arrangement was dictated by an extended experience of the builder, stress being laid on the convenience of the office. In this, however, as is generally the case, the owner has not a shed to his exact liking, and if building again he would make the alley 26 feet wide instead of 24. The front is of Menomonie pressed brick, trimmed with Kasota stone. The windows are 36x38. The letters of the sign are covered with gold leaf, all told the front, architecturally, presenting a fine appearance.

The piers of the foundation are laid to gravel, which was found from 3 to 4 feet be-

low the surface, 65 cords of stone having been used in their construction. The walls under the office are solid. The frame is of hemlock, with the exception of the 26-foot rafters over



DETAIL OF FRAMING.

the alleys, and the posts. The sides are covered with No. 3 hemlock boards as a backing for steel in imitation of brick. The roof boards are 4-inch, No. 3 flooring, D. & M., over which 170 squares of ready roofing were laid. The



EXAMPLE XXVIII—SHED OF THE STEARNS LUMBER COMPANY, AT HUTCHINSON, MINN.

eave troughs are 8-inch galvanized, with 5-inch conductors, which discharge into stone paved gutters.

As may be seen from the plan and the exterior view of the shed, there are two rows of windows on the roof, instead of a single cupola such as is commonly built on inclosed sheds, thus providing for extra ventilation, yet Mr. Stearns says that while the ventilation is good it is not sufficient to dry lumber direct from the saw. For the green stock there is an

annex on the rear of the shed 20x112, the open along the alley. The windows are opened by ropes which run over pulleys. The doors are operated up and down by wire over steel pulleys, a device that is said to admirably. For reaching the upper decks are stairways so arranged that the ascent is easy.

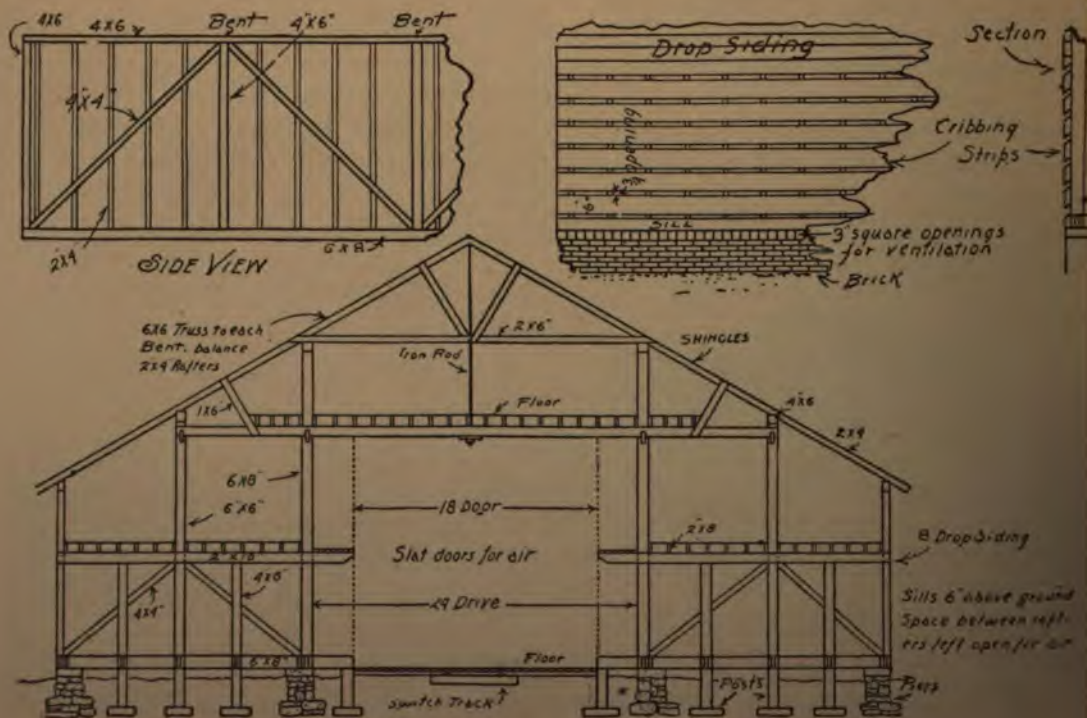
It is believed that the plans will otherwise show the arrangement and construction. The shed was erected in 1902.

Example XXIX

A Wisconsin Shed

These are detail plans of a shed that was built by the Doyon & Rayne Lumber Company, Madison, Wis. It was built on marshy ground and the cost of the foundation was

\$250. The building is 60x96 feet, and the 24 feet wide, with a switch track running through it. Over the alley is a storage. The cost of the shed was \$1,500.



EXAMPLE XXIX—END ELEVATION AND DETAIL.

Example XXX**A Truss Roof Open Shed**

wide open shed is popular with many men and is a type that is constantly in favor. These dealers say that lumber requires only a roof over it, the air being pass through it from every direction.

A dealer remarked, in effect, that while the open shed is the proper thing for he did not regard it as the proper thing as it forced his men and teams out of when doing their work. In other words, it covers the lumber, but not the men and teams unless it have a wide hood, which of the yard man quoted did not have. A double deck is objectionable to many

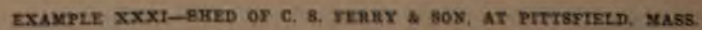
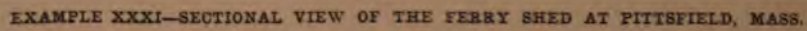
as they have learned that it costs to put lumber into the air. They want lumber under roof, yet their piles so low

that one man can at any time load a wagon from them. To do away with the double deck and the condition which crowds the men and teams out of doors this shed was invented, and has been adopted by several lumbermen in Philadelphia and its vicinity. It can readily be seen what a commodious affair it is and how well it fits the case of those dealers who want to do a lumber business out of doors, yet at the same time with the advantage of being under a roof. In this shed not only is the lumber covered but the alleys as well. If it is desired that it shall not be wholly open, that one side, or end, be boarded up, of course it can be done.

This kind of shed is erected by Edmund Molloy & Son, Philadelphia, under a patent



EXAMPLE XXX—MOLLOY PATENT TRUSS ROOF CONSTRUCTION.



owned by the elder Molloy, the particular shed shown belonging to a Philadelphia lumberman, and is 95x289 feet, 28 feet high. On one side of the shed are 70 bins, 9 feet high; on the opposite side the posts are 34 feet apart. The posts are set in an iron shoe which protects them from decay and at the same time serves as a foundation. A span of 117 feet has been covered, and it is said that a test of seventeen years has shown that the structures have not been unroofed by wind or crushed by

snow. The cost of the shed illustrated was 20 cents a square foot, the total being a trifle under \$5,500.

The fact that the Molloy shed is patented is no reason why any yard man who desires a shed similarly constructed should not have it, as no doubt there are contractors by the scores who would undertake to build a truss that would answer the purpose. The shed is a type that will appeal to the tastes of many handlers of lumber.

Example XXXI

A Massachusetts Shed Plan

When C. S. Ferry & Son, Pittsfield, Mass., built the shed herein illustrated it was after years of experience had taught them what they wanted. The shed bears the stamp of originality. It is a Ferry shed and none other. Among the principal objects were light and strength, both of which were obtained in a marked degree. Perhaps less timber in the frame would have answered all practical purposes, but it would not have satisfied the builders. The back sills are 10x12, timber of a size that these days is rarely seen in a shed of any dimensions.

The builders were intent on having light in every nook and corner. The windows in the cupola are as continuous from one end of the building to the other as they well can be, a provision for lighting that would be thought ample by perhaps ninety-nine one-hundredths of the shed owners of the country, but with these yard men, as it will be observed, this was only a good beginning, as there is a window, 3x4 feet, in the rear of every bin both below and above, and in addition as many as can be set lengthwise of the alley doors. By

day the shed is as light as an inclosed shed could well be, and for evening work it is profusely hung with electric lights. All the windows in the cupola and in the sides can be opened for ventilation.

The most novel feature, however, is the walk, or platform, in the rear of the bins. In the inclosed shed, as commonly built, only the front of the piles can be seen except at the expense of crawling over them, while in this one the rear of the pile as well as the front can be inspected, if necessary. This platform certainly gives to the shed a commodious appearance and it is highly regarded by the owners. The bins are 18 feet deep (20 including the platform), 10 feet from center to center, with the upper deck floored.

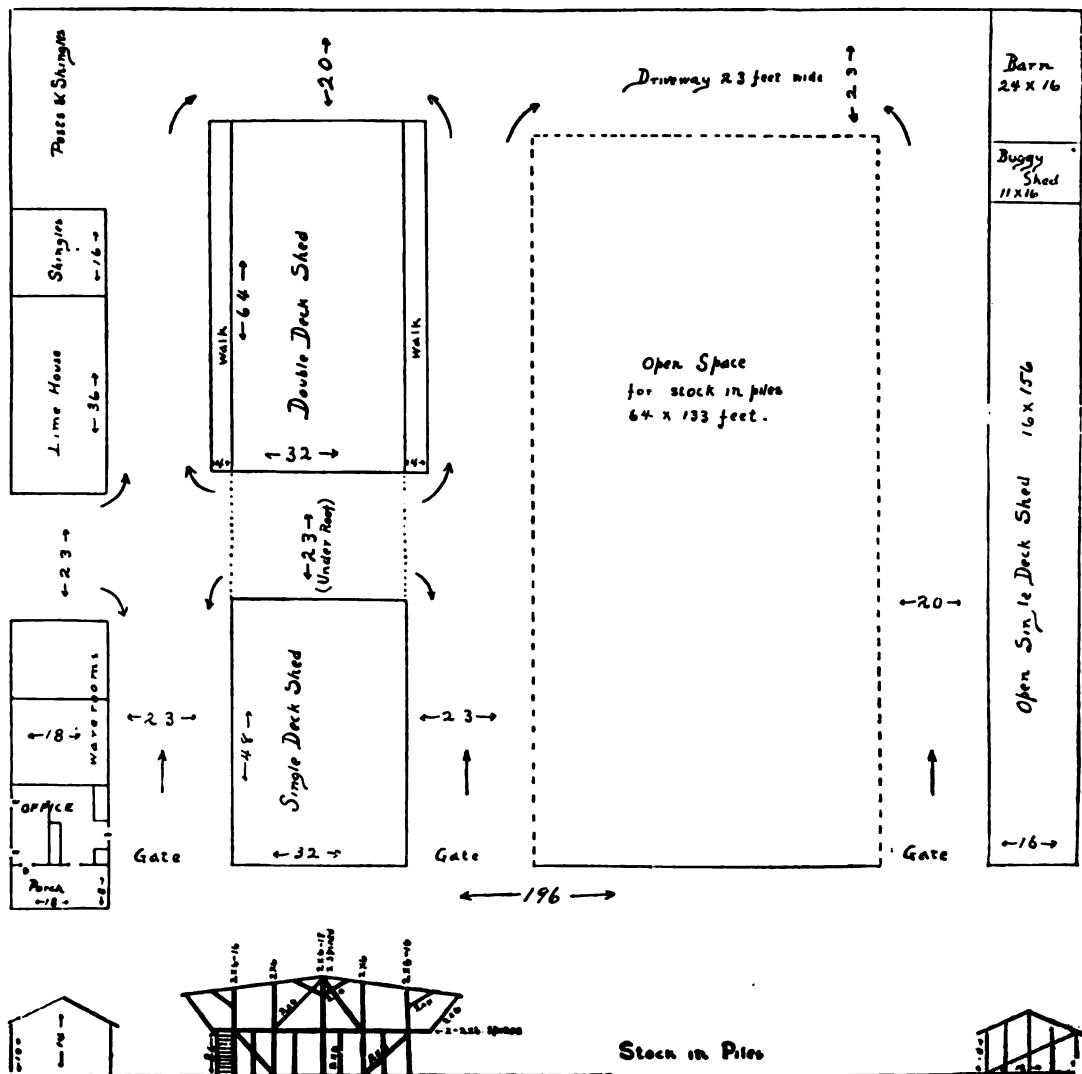
In size the shed is 58x150, and the alley 18 feet wide, unplanked. The foundation is of piles, 400 of which were driven, these piles being from 12 to 40 feet in length, to answer the requirements of the soil. The entire cost of the shed was \$5,000, the foundation costing \$1,200 of this amount.

Example XXXII

An Idea From Missouri

The plan of this shed and yard that was put in by Bruce & Early, of South St. Joseph, Mo., may have some ideas which may be beneficial to others. In a general way the arrangement accords with the ideas of several dealers who

have had long experience. An excellent feature is the roofed space between the two sheds under which wagons, loaded or empty, may stand during the night, or when the weather will not permit of lumber being delivered.



Example XXXIII

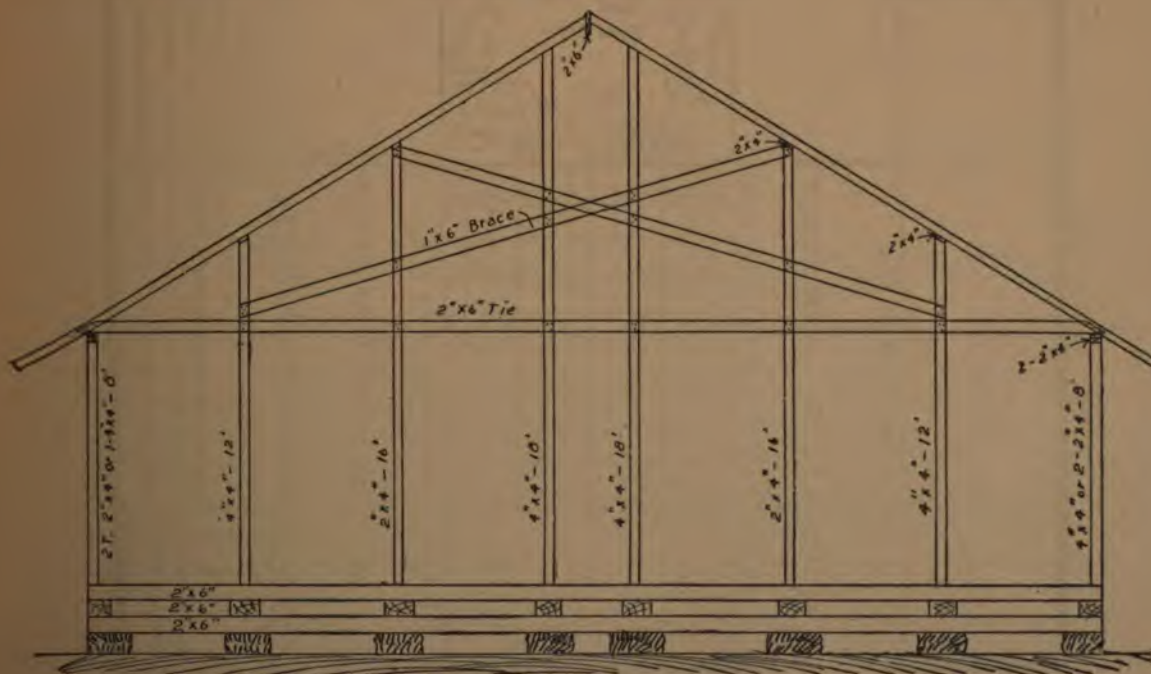
A Wide, Open Shed

This plan of a wide, open shed is one from which several sheds have been built by A. L. Chesley, a veteran in the retail business, now president of the Spencer Lumber Company, Spencer, Iowa. The shed is 34 feet wide, the one at Spencer is 153 feet in length, and in it can be stored 300,000 feet of lumber. The bents are 9 feet from center to center, and in the bins it is the intention that two piles, 4 feet wide, shall be placed, leaving plenty of elbow room.

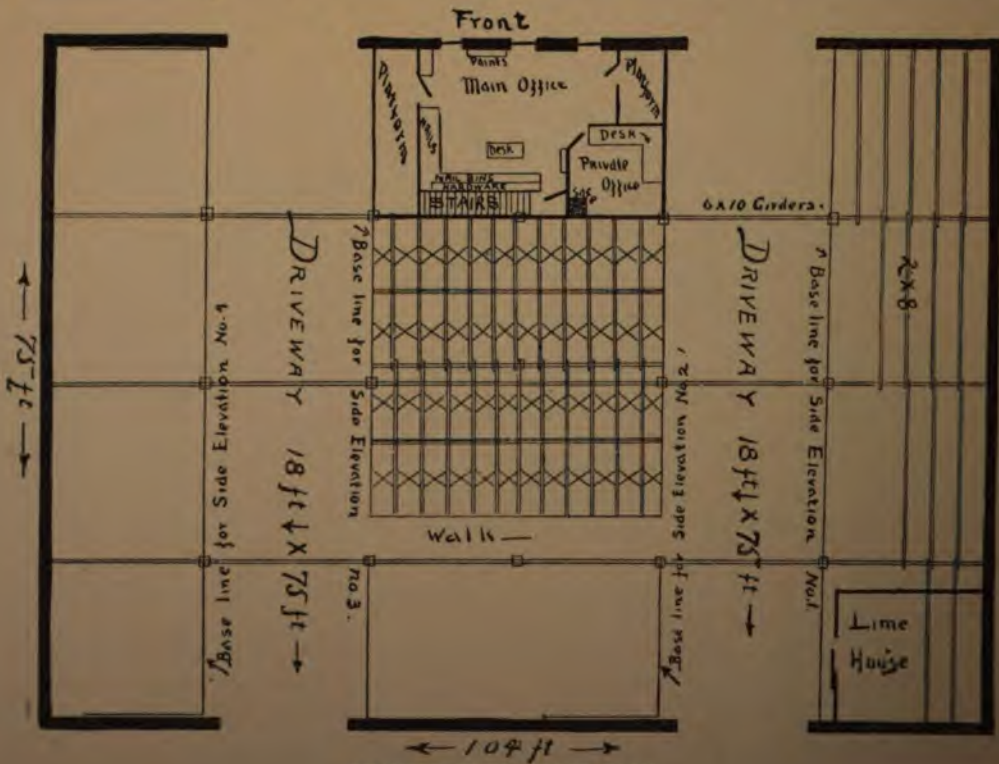
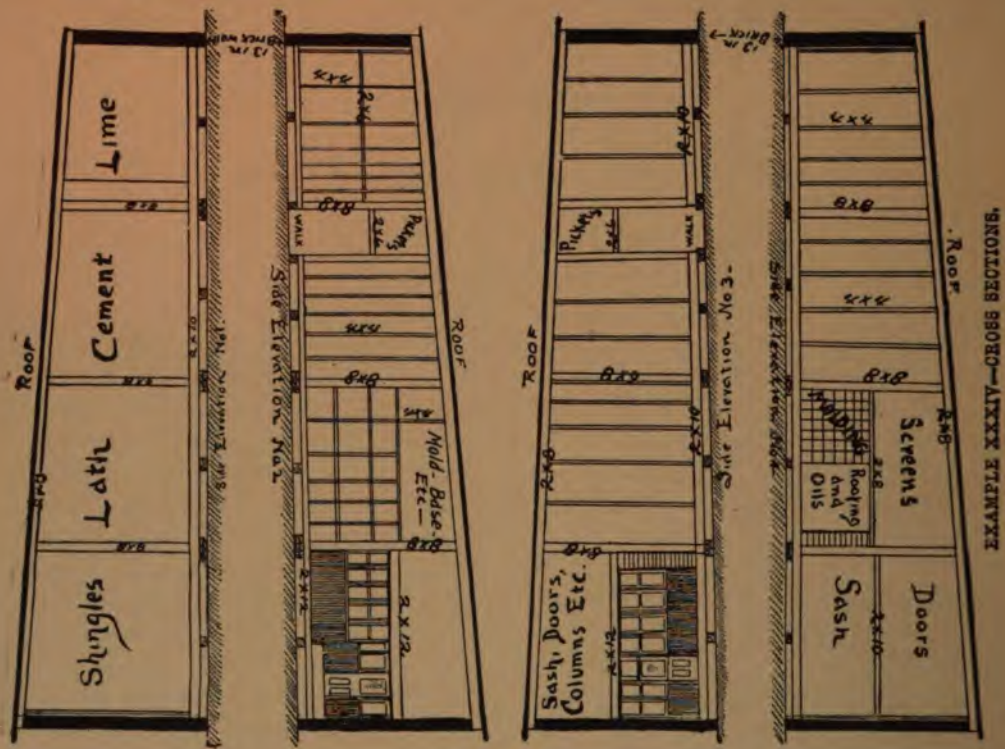
The sills are made of three layers of 2x6, eight of them running lengthwise of the building, with a cross sill every 9 feet, all of them well tied together by interlapping. The sills are blocked underneath with stone at all post bearings and are used as foundations for the

piles. In building the shed the ground is leveled, the sills laid with stones but slightly above the ground, and this done the bents can be put up one by one. If there is haste to pile the lumber it can be placed as soon as the foundation is laid and before the bents are placed in their permanent positions.

The shed is intended for a yard in which there is plenty of room and for a class of lumber that is kept on the outside by many dealers, such as dimension, sheeting, shiplap, grooved roofing, stock boards, and even timber if so desired. It is not the intention to make use of the upper part of the shed; still it is a place where ladders, select 2x4 and other items which are not called for every day may be stored.



EXAMPLE XXXIII—END ELEVATION OF WIDE, OPEN SHED.



This shed can be built for less than \$4 a lineal foot. For each 9 feet the bill of specifications is:

	Feet.		
Sills	318	Two posts, 18 feet	48
Two posts, 8 feet	22	One tie, 2 x 6, 34 feet.....	36
Two posts, 12 feet	32	Two braces, 1 x 6, 18 feet.....	18
Two posts, 16 feet	41	One ridge, 2 x 6, 9 feet.....	9
		Eight plates—outside plates doublets— 2 x 4, 9 feet.....	46
		Rafters, 2 x 4, 22 feet, 24-inch centers...	132
		Roof boards.....	400
		Shingles (pieces).....	3,250

Example XXXIV

For Storing Sash and Doors

H. L. Munn & Son, Ames, Iowa, have a warehouse for the storage of sash and doors that embraces some good ideas. It is 20x40 feet, and in the center of it is a deck that might be likened to a big table. This table is six feet wide, sufficiently high to admit of a bundle of sash under it, and on top may be stored building paper, or doors. The two side tables are built in the same way, except they are only

the width of a door, the idea being to pile doors lengthwise. This may be called a simple and convenient arrangement. When following this plan it would be desirable that the room should be as tight as possible, to exclude dust, and if so dark that an incandescent light must be used it would be an improvement, thus preventing the material from becoming discolored by the action of daylight.

Example XXXV

A Shed Idea From Arkansas

C. A. Stuck & Sons, of Jonesboro, Ark., think they have a very convenient shed and one in which the arrangement could not be improved upon for the economical handling of goods. The ground plan shown herewith gives a general idea of the arrangement of the interior, together with the office and its fixtures. The joist are laid and braced on all sides, as shown in the center. The rafters are placed on girders as shown, the girders being 6x10 inches and supported throughout the entire building with 8x8 columns. The cross sections show the

arrangement of the bins and partitions. No. 1 is the left side of the left-hand driveway; this side is floored and is where lime, cement, plaster and shingles are kept. No. 2 is the right side of the left-hand driveway and shows the office and the upstairs (where glass and scroll work are kept), and stalls for finishing lumber and strips. No. 3 shows the left side of the right-hand driveway, giving the office, upstairs (where glass, doors, crestings, valley and gutters are stored), and stalls for flooring and ceiling. No. 4 is the right side of the right-

hand driveway and shows the sash room, upper deck for doors and window screens, molding racks, room for ready roofing, etc., and stalls for siding of all kinds and grades. The shed is lighted from the four large doors at the driveways, the doors being each 14x15 feet.

In speaking of this shed its owners say: "We have a place for every article, grade and length, and it is our motto to keep everything

in its place, thereby keeping our shed clean. All of our floor joist are on an average of six inches from the ground; all our uprights partitioning off stalls are 4x4s, and hence give plenty of air space for ventilation. We have never had any trouble arising from light or ventilation. We have water pipe laid in each driveway for fire protection and for sprinkling the driveways."

Example XXXVI

Simple Hood-and-Platform Shed

This shed of T. H. Earle & Co., Darlington, Wis., is a modification of a type that is not often seen. It is a style of structure which shows how applicable the hood and platform are to the commonest kind of shed. The bents are 8 feet apart, the stone on which each post rests being 2 feet square. For the lower bear-

ings No. 2 2x12—16 are used, one placed each side of every post and spiked to it. The upper bearings are 4x6, resting on the 2x10 that projects to form the support for the walk, as seen in the engraving. Attached to the rear of the structure is a shed under which timber is stored lengthwise.



SHED OF T. H. EARLE & CO., DARLINGTON, WIS.

Example XXXVII

A Molding and Trim Shed

Herewith will be found a sketch of a shed that was built by George S. Gynn, of Cleveland, Ohio, for the storage of molding and trim. It is practically a box building, with 18-foot studding set on top of the ground, covered with patent siding, and with a gravel roof, having a 12-inch pitch. The building is 24x48 feet. Light is admitted to the room from two 3x7-foot sky lights, made from ordinary hot bed sash. Two 2—8 6—8 doors slide on rollers inside the building. The room is divided by studding into four 10-foot sections. Two or three cleats are nailed across the studding at proper intervals and crossarms are nailed at

requisite spaces to all the partition walls, and also to the two end walls. These cleats project into the alleyways about three feet and at a height to accommodate 12-foot lengths. An alley, 18 inches wide is left immediately back of the doorways, the entire length of the front of the building, to permit going from one alley to another without going outdoors. The building will hold five carloads of material, and to build will cost not far from \$300. As Mr. Gynn has the reputation of being a very able retail lumberman it follows that he sees merit in a storage shed of this description.

Example XXXVIII

A Simple Inexpensive Shed

For simplicity and economy this plan for a shed of a type that is used more than any other—and possibly as much as all others—has few duplicates. The frame was designed by a builder who studied out the relative values of the position of every stick. The shed is in the

yard of Perry & Bee, Fairbank, Neb., is 110 feet, and was built for \$160. Several sheds in the state have been built from this plan. The roof is battened and the tin eavestroughs are included in the estimate. There is no material used in the construction heavier than 2x6.



EXAMPLE XXXVIII—AT FAIRBANK, NEB.

Examples XXXIX-XLI

The Sheds of Colorado Springs

In Colorado Springs, Colo., there are doubtless more large sheds which cost more money than in any other city of its size in the country, there being three the expense of building which was not less than \$20,000 each, exclusive of the ground. In addition to these three sheds there is one owned by the Crissey & Fowler Lumber Company that is 100x100 feet. At the time an investigation was made of these sheds not far from 18,000,000 feet of lumber was carried in stock that was worth \$400,000.

The shed of the El Paso Lumber Company is 190x200 feet. In its construction 280,000 feet of Oregon fir and 350,000 brick were used. For roofing 390 squares of tar and gravel were required. The shed at the highest point is 22 feet, and in it there are 560 bins, a portion of them 4 feet and the balance 8 feet wide. For the pile foundations there is a mile and a quarter of concrete and stone 8 inches thick and laid from 14 to 27 inches deep. The foundations go to gravel which was so tenacious that it required to be blasted. The walls are 13 inches thick. In excavating it was necessary to remove more than 4,000 cubic yards. The timbers are built up from 2x6s and 2x8s.

There are four alleys, each 20 feet wide, and

if placed end to end they would measure 760 feet. Over each alley there are three gable skylights, 18x16 feet, the frames of galvanized iron. The runways are three and a half feet wide and measure one-third of a mile. The alley doors are 16x16 and weigh 1,500 pounds each. On the south side of the building, in the rear of the office, there is a platform 19 feet wide and 2 feet high for cement, nails and glass, and over this platform is the stock room for sash and doors. Along the east side of the structure is a spur track of the Colorado Midland and directly from the cars on this track cement etc. is unloaded upon the platform.

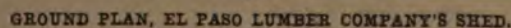
The office is 18x53 feet, is most commodiously arranged, and is heated by a furnace in the basement. There are two closets, one for the office force and the other for the men in the yard. In the shed there are four inch and a quarter standpipes, with hose attached. On the north side of the building there are thirteen stalls and a box stall for Prince, the trotter, that is driven by Grant C. Hemenway. The cost of the shed was \$20,000 and its capacity in inch lumber is 5,000,000 feet. W. E. McClung, now of the Newton Lumber Company, of Colorado Springs, was the architect of the El Paso shed.



SHED OF THE EL PASO LUMBER COMPANY, COLORADO SPRINGS, COLO.

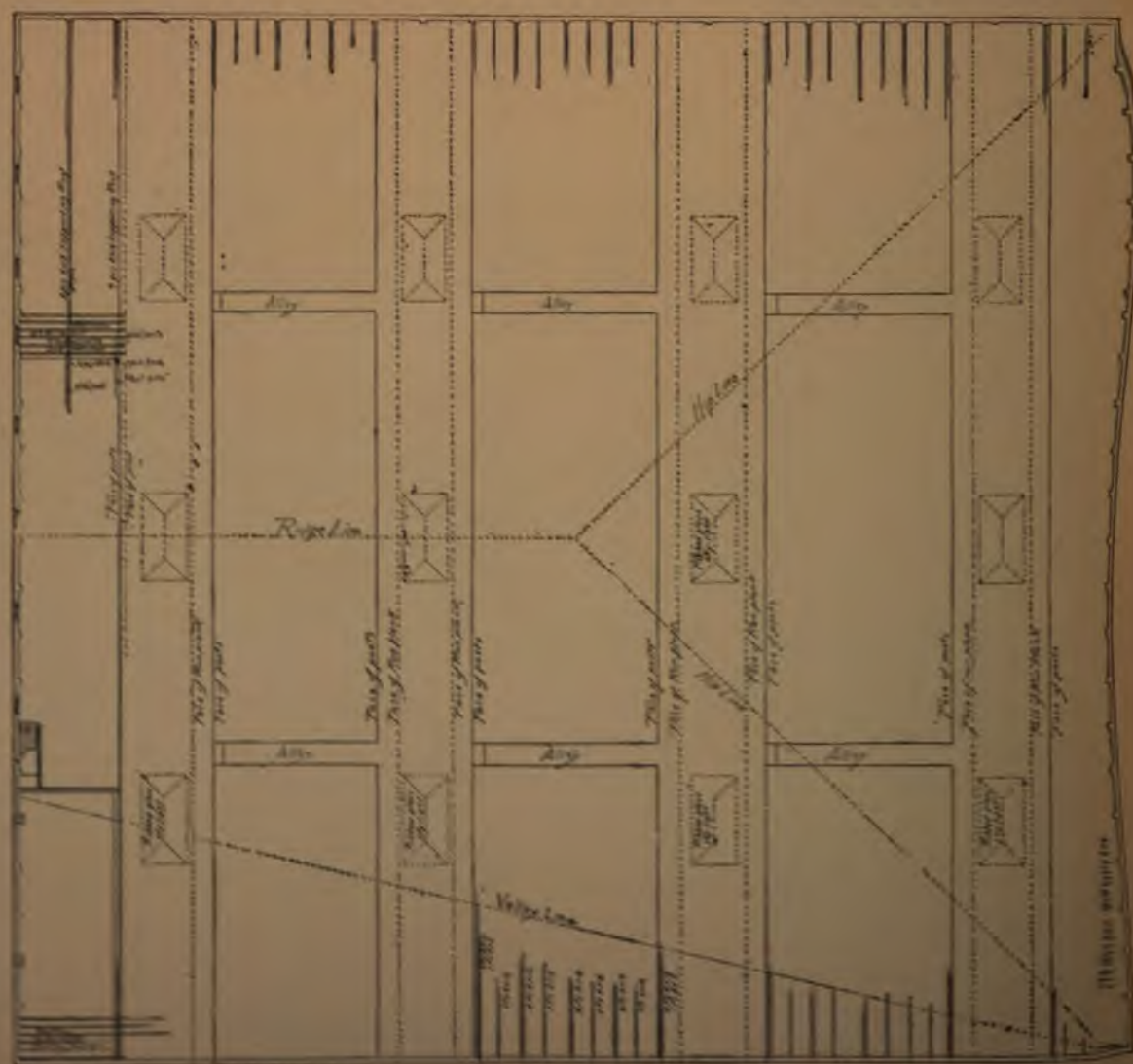


SHED OF THE HOUSTON LUMBER CO., COLORADO SPRINGS, COLO.



rail and along these rails over the alleys run platform cars—a device that is seldom seen in a shed. In the north end of the building there is a warehouse 60x190 feet with a basement on the wall side of it 24x190 feet, 9 feet in the clear. Between this warehouse and the shed proper there is a fire wall that extends above the roof, the openings closed by fireproof doors. The ceiling of this basement is a stoutly built platform on which will be unloaded from cars

on the track alongside the building the heavy material, outside of lumber, that is handled. A convenience is an electric elevator that cost \$1,000. In the construction of the building 500,000 brick and 255,000 feet of Oregon fir were required. The cost of the shed was \$21,000 and the ground \$15,000. The office, which occupies a separate building, is an elaborate affair. George M. Houston, of the company, was the architect.



SECOND STORY AND ROOF PLAN OF THE EL PASO LUMBER COMPANY'S SHED, COLORADO SPRINGS, COLO.

Example XLI

The Leader in Mammoth Shed Building

The first large, expensive shed erected in Colorado Springs was by Frank E. Johnson, local manager of the Newton Lumber Company. In a half million dollar fire the sheds, stocks of the Newton Lumber Company, the El Paso Lumber Company and the Criss & Fowler Lumber Company were burned, a loss to the three lumber concerns of \$5,000. The year before the El Paso met a loss of \$30,000 the burning of its shed in Cripple Creek, with no insurance, the loss, 10 percent, having been thought too high to pay. Such were the profits on lumber in the gold camp at that time, however, that the business of the year showed no loss. Following the Colorado Springs fire, while yet the ashes covered live trees, Mr. Johnson decided on the character of the shed he would build. The head of the Newton company, coming up from Pueblo,

adhered to the plans, when he was told by Mr. Johnson that the shed was not for the company but for himself, and then followed a condition probably has not existed elsewhere, namely, a local manager renting to the company by which he is employed a shed and warehouse that cost \$21,000, built on ground that was worth \$18,000.

The shed of the Newton Lumber Company is 122x190 feet, with two alleys 20 and 22 feet wide respectively. The shed is 26 feet high at the crown and over each alley there are three gable skylights 12x16 feet. The warehouse is 25x190 feet, two stories and basement, with the store and office in the street end of it, the former devoted to paint and hardware.



AN ALLEY IN THE NEWTON LUMBER COMPANY'S SHED.

ected to the plans, when he was told by Mr. Johnson that the shed was not for the company but for himself, and then followed a condition probably has not existed elsewhere, namely, a local manager renting to the company by which he is employed a shed and warehouse that cost \$21,000, built on ground that was worth \$18,000.

This warehouse is built to carry 1,000 pounds to the square foot and is alleged to be the strongest building in the city.

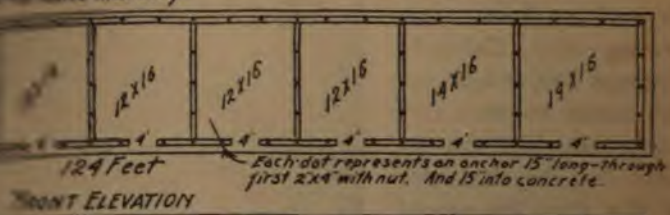
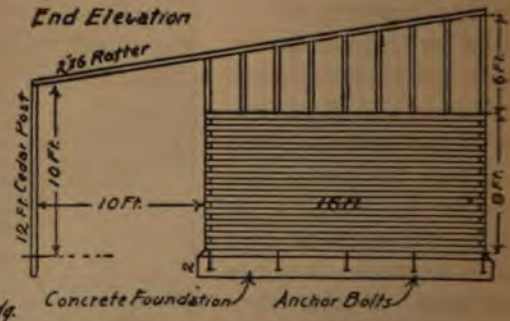
It may surprise lumbermen in other sections of the country that these sheds are not provided with better ventilation, but it is claimed that in the climate of Colorado it would be unnecessary.

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DESIGNED BY THE STREETER-KALLGREN LUMBER COMPANY.
FOR THE LUMBER COMPANY OF THE LOOMANS LUMBER COMPANY.

End Elevation



Example XLII**A Coal Shed Plan**

A coal shed from these plans was built by the Streeter-Kallgren Lumber Company, Grant Park, Ill. The foundation of the shed is concrete, laid 2 feet in the ground, and extends 4 inches outside the walls of the building. The cement floor is 5 inches thick, with the exception that 5 feet from the track side, where it gets the hardest usage, it is 6 inches thick. The floor and foundation cost \$360. The first 8 feet of the wall is built of 2x4s, spiked one on top of the other, the first being bolted to the foundation with anchor bolts which are set in the concrete 15 inches, this bolt being secured to the top of the 2x4 with a washer and nut.

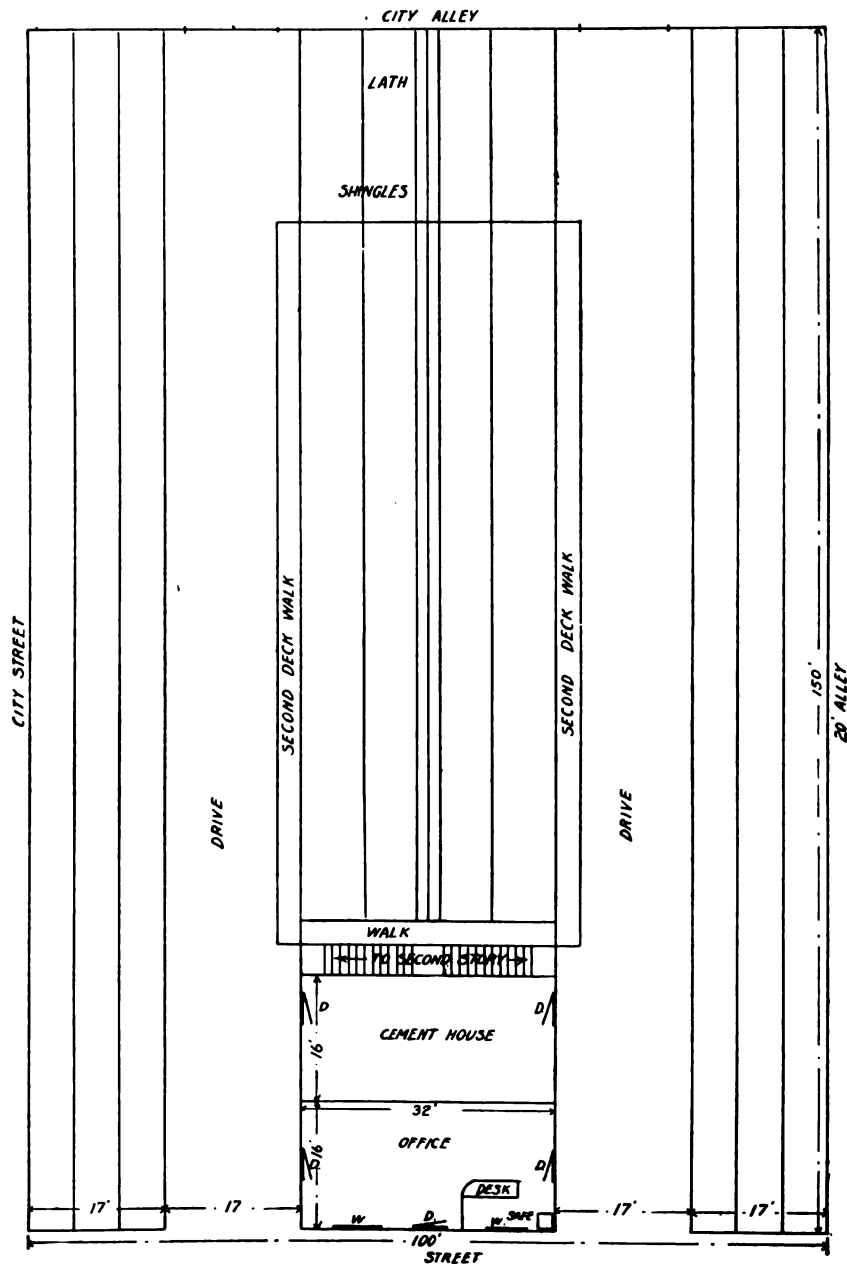
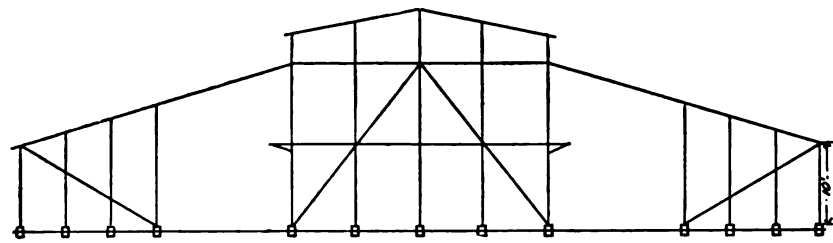
Above this 8-foot wall of 2x4 there is studding boarded up. In the front, above the 2x4 wall, there are doors the width of the bins, which swing upward when the coal is being laid in, and in each door there are 3 light 8x10 sash for lighting the bins when the doors are closed. A railway track is laid the length of the shed in front. The driveway is 10 feet wide, supported by cedar poles, the roof 10 feet from the ground. The roof is covered with paper. At each end of the driveway there is a rolling door which can be securely locked. The cost of the shed was \$1,200, and its capacity is 600 tons.

Example XLIII**Another Coal Shed Plan**

This shed, built by the Loomans Lumber Company, Waupun, Wis., is not a type often seen in a small town. The shed has a capacity of 1,000 tons. The posts are set in cement 3½ feet. The following is a bill of specifications:

- 32 7-inch 18-foot posts.
- 4 7-inch, 22 foot-posts.
- 14 7-inch, 25-foot posts.

- 6,340 feet, 2-inch hemlock, for sides.
- 8,500 feet 2-inch hemlock, for floor.
- 2,000 feet, 2-inch hemlock for plates and ties.
- 76 pieces, 2x6x22, for rafters.
- 38 pieces, 2x12x18, for deck.
- 500 feet hemlock, for roofing.
- 14 squares felt roof.
- 1,000 feet common boards.
- Shingles.



EXAMPLE XLIV—GROUND PLAN AND END ELEVATION.

Example XLIV

A Good Kansas Shed

This shed, at Kinsley, Kan., has proved thoroughly satisfactory to its owner, the Kansas Lumber Company, which operates a line of yards from Hutchinson. S. M. Johns, of this company, is particularly proud of this shed, because of its convenience and capacity. At one time a stock of lumber valued at \$20,000 was stored in the building.

The shed is 100x150 feet, the side walls 10 feet high. The foundation is cement blocks, 18 inches apart, and two blocks high, one block above the ground, thus admitting air at every point. All the bearings are supported in a like way. The framework consists of three pieces of 2x4 for all posts, the sills and bearings cut in between. The siding is of steel, brick size, stone face, and is painted light gray, trimmed with white. The roof is No. 2 boards, covered with ready roofing. The stationary stairs back of the cement room lead to the platforms of the second decks, as well as to the second floor

over the office and cement room, where molding, doors and millwork are stored. The location of the desk is such that the manager has a view of all teams entering the shed in either alley. The cement room has a capacity of four cars, and it will be observed that a customer's wagon can be loaded from either alley. In the rear of the shed is a city alley, on one side is a street, and on the other an alley 20 feet wide. Builders will find in this shed several features worthy of imitation. As a combination of a single and double deck shed, with convenient stairs and office arrangement, it would be difficult to excel. A cross alley in the extreme rear end of the shed that would permit a team to drive from one alley to the other would perhaps be an improvement. If the taste of a dealer were for alleys wider than 17 feet they could be made so at little extra expense. With these suggestions carried out it would be a shed not easily beaten.

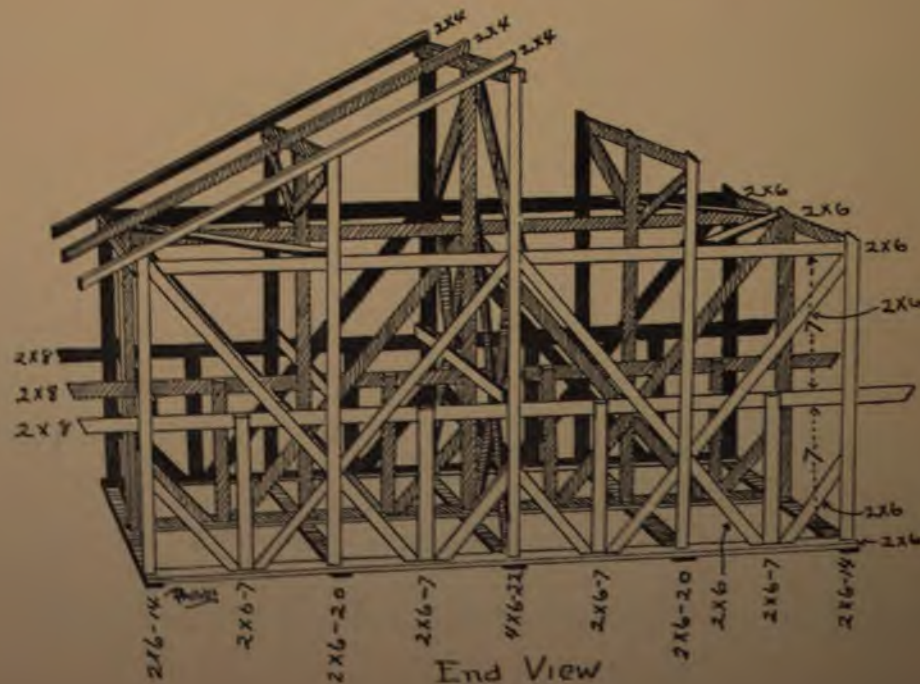
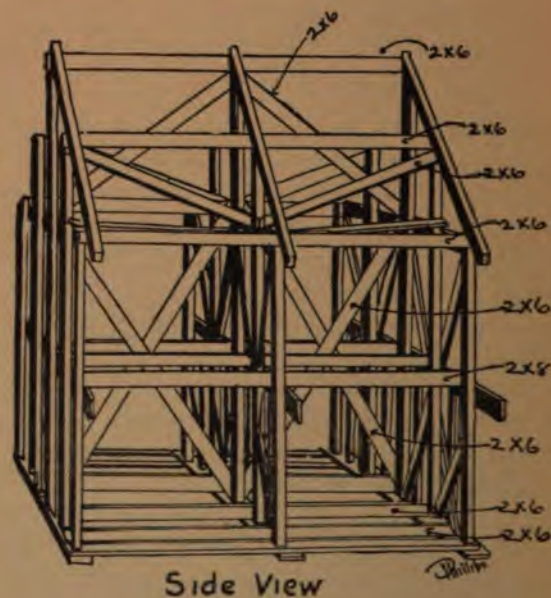


EXAMPLE XLIV—PERSPECTIVE VIEW KANSAS LUMBER COMPANY'S SHED.

Example XLV

Building Sheds From a Model

Instead of drawing plans for the carpenter to work from, the Z. Roberts Lumber Company, of Greenville, Iowa, builds a model of two bents of its shed, every stick cut to scale just as it would be if represented in a drawing. This model is then given to the carpenter with instructions to build as many bents as are required. The shed is of the umbrella type, double deck, 33 feet wide, the bents 10 feet wide. The drawings presented herewith are made from photographs of the model. The cost of 100 feet of this shed is from \$350 to \$400.



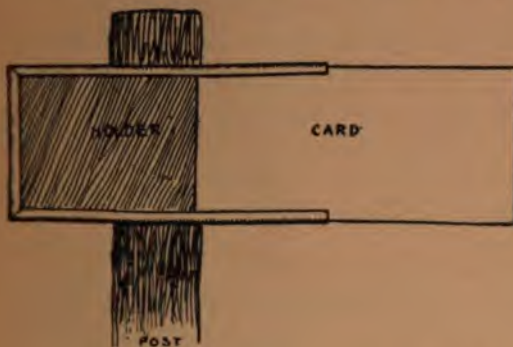
Shed
and
Yard Conveniences

THE following pages illustrate and describe a few of the handy ideas which have in actual service proved useful about the lumber shed or yard.

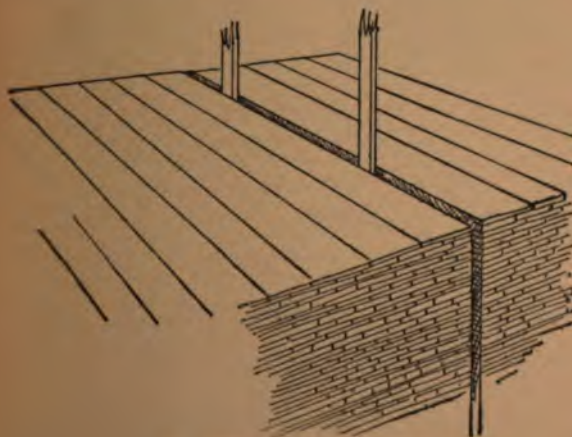
Shed and Yard Conveniences

For Tagging Lumber

To save time, that an employee may be able to get at once any item desired, a cheap and convenient tag is made with a piece of tin, say 2x4 inches, the edges of two sides and one end turned over, forming a receptacle for the cards which are inserted. On these cards may be



penciled any information regarding the lumber, as to grade, age, quantity etc. An advantage of this simple appliance is that any card can easily be replaced. Not infrequently when cards for this purpose are used they are nailed to the posts which, every time they are changed implies time, a hammer and tacks. This method described is an improvement in appearance over the old way, and saves time as well.



AN ASSISTANCE IN PILING.

An Assistance in Piling

When space between piles in the bins is required it is easy to stand pieces of 2x4 on end, pile against it, on both sides, thus leaving nothing to the eye, withdrawing the dimension when the piles are completed. In a few yards planks are dropped into slots which are attached to the posts in front of the bins, the plank raised as the pile becomes higher, every board being brought up against it, thus insuring an absolutely even front.

An Iron Tank Lime House

The cut herewith represents an iron tank type of lime house used in the East to some extent. It is a simple, square tank, made of

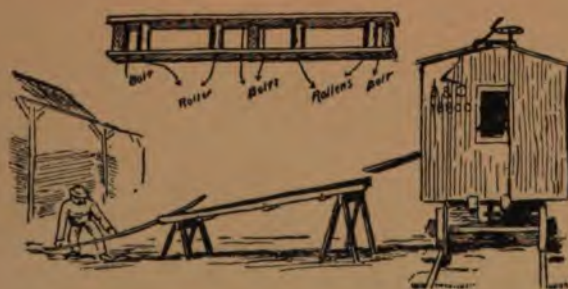


light iron riveted along the edges of the plates, as a boiler is made. There is a hatchway left in the top as a door to be used in filling the house, and there is another door left at the bottom, in the front of the house, so the lime can be taken out as wanted. By the use of packing both doors are secured against the entrance of air. Some of this class of houses also have an iron "apron" platform in front of the door to aid in shoveling loose lime.

While the idea is not a bad one, the average lumberman would probably object to this house on account of expense.

A Handy Lumber Conveyor

This device is satisfactorily used by the South Connellsville Lumber Company, of Connellsville, Pa. In construction it is very simple, consisting of two pieces of heavy dimension fastened by bolts and held by blocks a sufficient distance apart to accommodate the width of the boards. A series of rollers are fastened between the side rails, close enough



together to catch the board and keep it moving after it has started on its journey down the conveyor. Side boards could be added to keep the lumber from jumping off the rolls in transit, if the conveyor is a long one, but this will not often be necessary. The illustration gives a general idea of the manner in which the conveyor is constructed and used. It is plain that under some circumstances it would save labor.

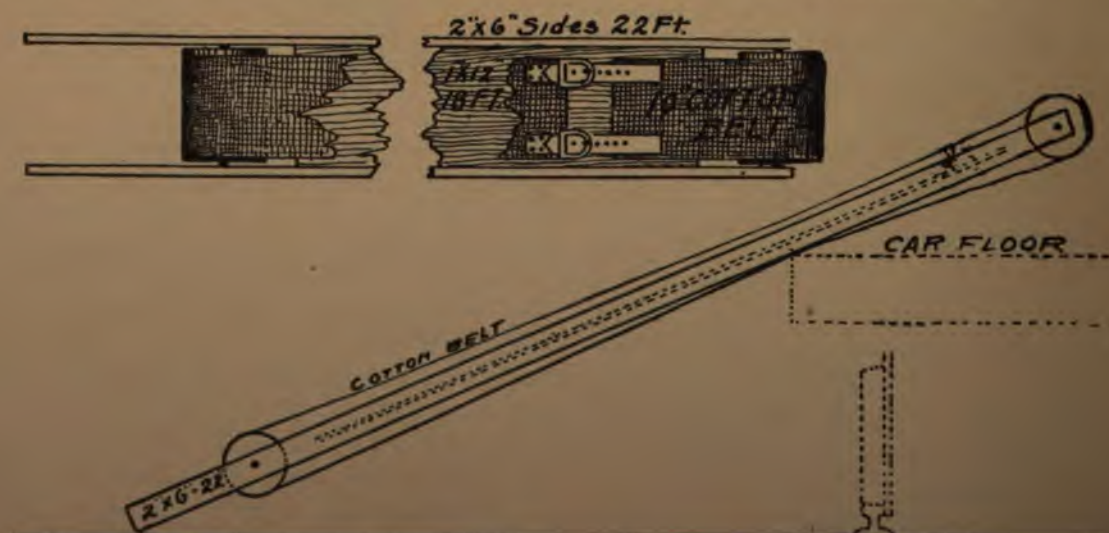


One Light For Two Rooms

This device for lighting two rooms, with one bulb, was seen in the warehouse of the Campbell Lumber Company, Canon City, Colo. Hanging the bulb in a hole cut in the partition lights both rooms and is a saving in bulbs and wiring.

For Unloading Brick From Car

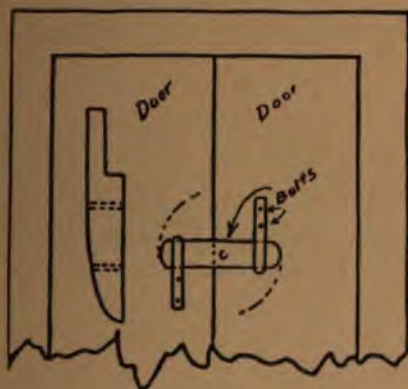
This conveyor was invented by Charles Harbaugh, Lake Villa, Ill., and its use has reduced the cost of handling brick one-half. The lower end of the conveyor rests on the ground, the other in the car door. When it is loaded the weight of the brick will run the belt. The conveyor can be made for about \$7.



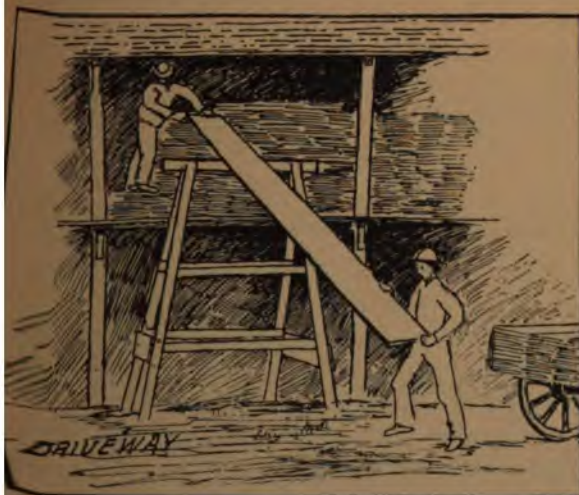
SELF-OPERATING BRICK CONVEYOR.

An Effective Door Fastener

An excellent fastener is attached to doors in the shed of the La Crosse Lumber Company, Jacksonville, Ill. Double doors when fastened with a hook belly out, and if inclosing a mold-



ing rack permit the dust to sift in. The cross piece of the fastener is 1x6x24 inches, made of oak. Then shape the pieces which hold the ends, with the bolts fasten all in place, and the result is a fastener that costs little and is easily manipulated.



A Handy Unloading Jack

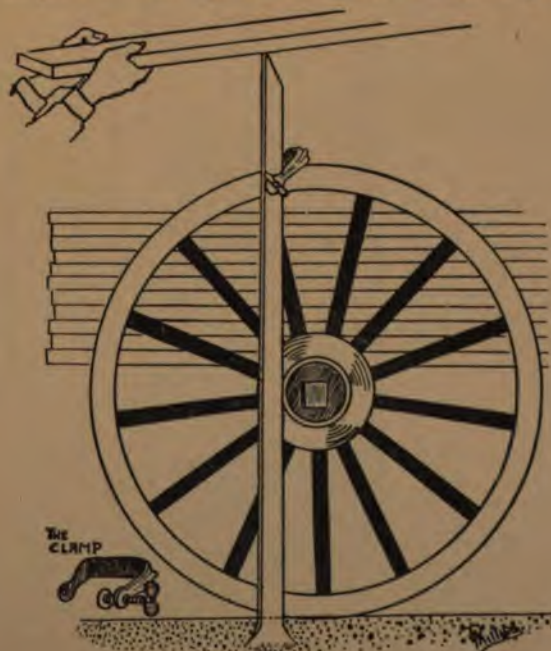
The Sharples Lumber Company, of West Chester, Pa., is using in its yard a very simple and handy jack for handling heavy stock. There are many forms of the lumber jack in

use, but this one is simple and durable, and has the advantage of wearing qualities which will be found lacking in many of them.

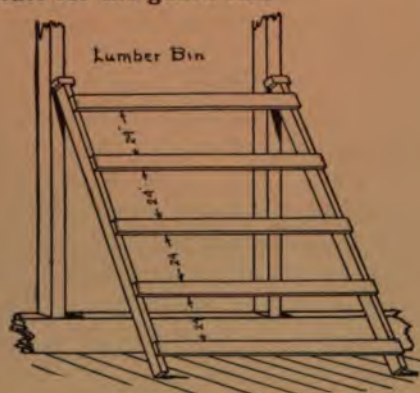
To make this device one needs only a plain, flat iron bar, one-half inch thick and two inches wide, which any blacksmith can cut to a beveled point on one end and hammer to a chisel point on the other; then it is ready for use. A common thumbscrew clamp is all the other part there is to it, and this can be procured for a few cents at any hardware store. The cut shows how the jack is used by sticking the flat end into the ground and clamping the top to the top of the wagon wheel, allowing the edge of the bar to touch the side of the hub to steady the whole arrangement. A glance at the cut will explain its utility.

A Piling Device

In opposite column is shown a piling horse used in some parts of New England. Three cross bars are nailed on the legs of an ordinary lumber horse at convenient height for the center and top of the lower deck piles and for the top of the upper deck piles, the idea being to furnish an intermediate support between the wagon and the pile in the shed, or from pile



to pile if, as is done oftentimes, the lumber is dumped from the wagon to the driveway and repiled afterwards. The drawing illustrates the idea. For the upper deck this is a poor substitute for the guard rail.



To Help From Car to Shed

This handy device was seen in the yard of the Eau Claire-St. Louis Lumber Company, St. Louis. It is as wide as one bent of the shed, the sides resting firmly against the posts. A plank is placed from the car door to one of the rungs of the ladder, the shed end of the plank being elevated as the pile increases in height. It is called a great labor saver.



FALSE DOORS FOR COAL BIN.

False Doors for Coal Bin

With the illustration as a guide any dealer who is handy with tools can make this device, which should be put in place before the bin is filled. Board after board can be removed, as the bins lower. One advantage is that it is no hindrance from closing the outside door.



Sacks for Handling Coal

These sacks cost 60 cents each, and hold 100 pounds of hard coal. To the sacks are attached leather handles, and one of them filled with coal can easily be carried by one man. Often it is necessary to deliver coal in baskets to bins which are in out of the way places, and when this is necessary these sacks can be used to advantage. Several small orders can be carried at one load and as many of them left at one house as are required. The running from yard to scales and from scales to yard is avoided. Dealers who use these sacks exclusively say they would not attempt to get along without them.

**Miscellaneous
Lumber Shed Views**

THE following pages are devoted to a large number of lumber shed illustrations, not sufficiently complete in detail information to be classed as "examples," and yet valuable and suggestive to the prospective lumber shed builder.

W. T. JOYCE COMPANY, WIOTA, IOWA—END ELEVATION.



SHED OF C. C. THOMPSON LUMBER COMPANY, NEWCASTLE, IND.



SHED OF THE H. W. ROSS LUMBER COMPANY, SIOUX FALLS, S. D.



SHED OF THE JONES-WORTHAM LUMBER COMPANY, DALLAS, TEX.

his shed of the C. C. Thompson Lumber Company, that succeeded the Henry County Lumber Company, Newcastle, Ind., is 66x132, two stories, the alley 20 feet wide and sided. A two story Indiana shed does not in a double deck shed, as in several sections in this state the space over the alley is utilized making it a second story, the floor being 10 to 14 feet above the alley floor. There are also three-story sheds in this state, a term which means that there are two floors between the alley and the roof. This space thus being utilized the sheds for their size have a large storage capacity.



The shed of the H. W. Ross Lumber Company, Sioux Falls, S. D., has open sides, 66x144, 18-foot alley; capacity, easily 1,000,000; 113,000 shingles were required to cover it.



The accompanying cut shows the shed of the Jones-Wortham Lumber Company, Dallas, Tex.; yard, 170x292 feet; sheds on the court 100 feet wide, aggregating 1,000 feet in length; sheds double deck and on concrete walls; in center of yard, double shed, 40x150 feet; platforms 5 feet wide, provided with guard rails; sash and door warehouse, 24x160; sash and door room, 24x30; shed under which to drive wagons, loaded or unloaded, 40x40; office, 12x30, two stories; front of yard, 292 feet, presents an imposing appearance.



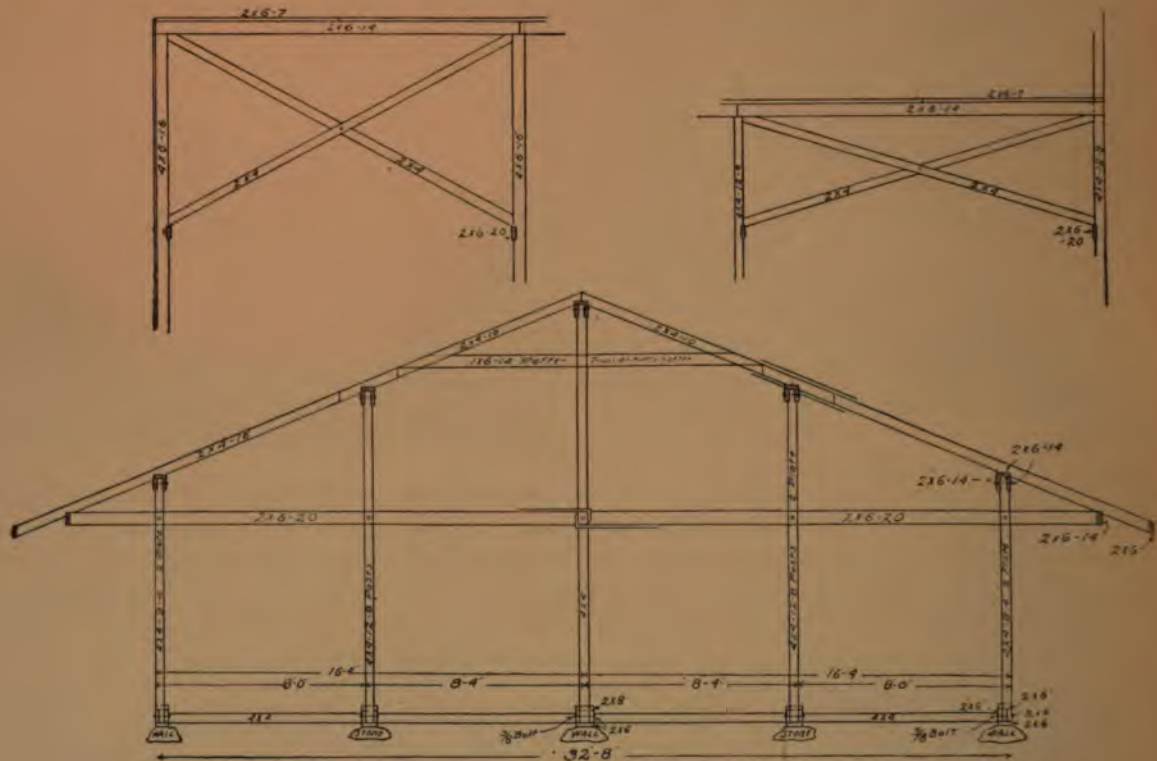
A shed that would be a credit to any retail merchant is that of the Oregon Lumber Company, Walla Walla, Wash. It is 120x120 feet, the alleys each 18 feet wide. The capacity of the shed is 1,000,000 feet.



The shed of the Montgomery Lumber Company, Kenosha, Wis., is 100x150 feet; alley 24 feet, planked with 2-inch hemlock; yard alleys planked with 2-inch mill cull rock elm; supported on poles set in cement; the 600 feet of platform have guard rails.



The shed of Canfield Bros., Cedar Rapids, Iowa, is of pole construction, double deck, 88x126 feet, two alleys; lower bins, 9 feet; upper, 8; one side open, on opposite side, space from ground to siding of 2 feet open; windows in the cupola, 4 lights, 8x10; molding, case, base and other items of interior finish stored in end; frame, yellow pine, 2x6; office, 12x26 feet, divided into front and rear rooms, with wareroom over office of same dimension; notable example of cheap, good shed, its cost, excluding labor of proprietors, being not far from \$1,500.



DETAILS OF THE SHEDS OF THE JOHN W. TUTHILL LUMBER COMPANY.

The above detail drawing is of a shed that was built at Sioux Falls, S. D., by the John W. Tuthill Lumber Company, a concern that has

a line of yards, and represents the type most in favor by Mr. Tuthill. The drawing is sufficiently self-explanatory.



SHED OF LONG-BELL LUMBER COMPANY, WICHITA, KAN.

The shed of the Long-Bell Lumber Company, Wichita, Kan., is the crack plant of the company; frontage, 180 feet; double shed, three decks, 34x140 feet; single shed, three decks, 16x100; sash and door room, 35x40; molding house and storage, 20-foot posts, 14x24; office two story, brick, 20x40. See Example XX for further Long-Bell suggestions.

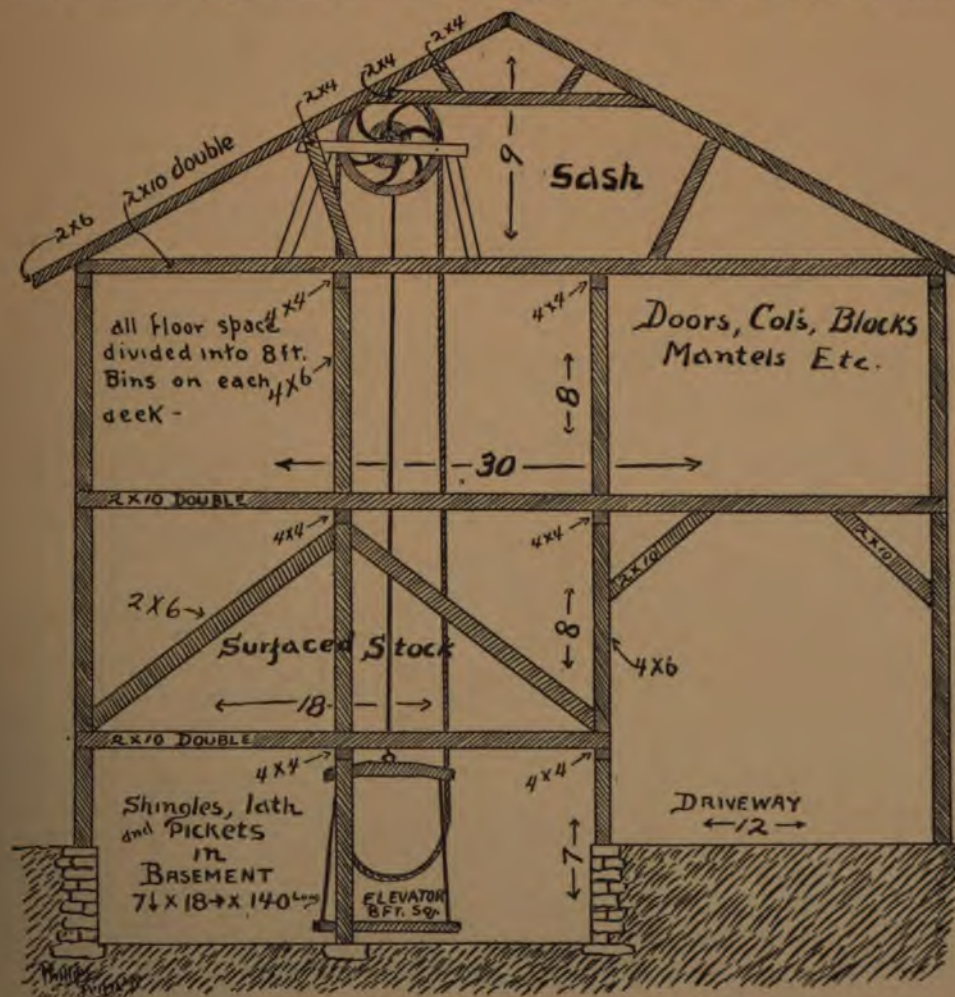


The accompanying elevation plan is from the Diamond Lumber Company, Ltd., McKeesport, Pa.; with ample ground it is not likely that this shed would be duplicated, but where

one is cramped for space it might serve as a suggestion.



The shed of Hayes, Lucas & Morse, Rochester, Minn., is 90x140 feet; three decks; two alleys, each 16 feet; office, 16x18 feet.



ELEVATION PLAN, DIAMOND LUMBER COMPANY.

The accompanying plan is of the shed of J. R. Moorehead, Lexington, Mo.; 110x140 feet; foundation round, white oak posts, from 8 to 12 inches in diameter, set with 4-foot centers, running along the alley line; all uprights are 4x4 and 4x6, 8-foot centers; bearings and decks, 2x6, spiked on both sides of the uprights; all braces are 2x4 and rafters 2x6; plates, 2x6, spiked to the sides of the posts edge up.



Wheeler Lumber Company, Des Moines, Iowa, have a shed 72x280 feet; alley, 20 feet; bins 14 feet centers; 28 feet to the eaves; three decks; siding, 4-inch strips, with 2-inch space between them.



The shed of Holcomb Bros., Sycamore, Ill., is 54x95 feet; molding stored on end in room 18x18 feet; in portion of shed lumber stored on end.



The shed here shown is now owned by the Yawkey-Crowley Lumber Company, Waupun, Wis.; 60x160 feet; distance to crown, 32 feet; frame heavy, supported by stone piers; roof, which has a third pitch, distinguishing feature; over office a warm room, 16x20 feet, for maple flooring and hardwood lumber, which is heated by register in office ceiling.



SHED OF YAWKEY-CROWLEY LUMBER CO., WAUPUN, WIS.



THE ACCOMPANYING ENGRAVINGS SHOW THE METHOD OF ERECTING THE WALLS OF THE CONCRETE SHED OF THE JEWETT LUMBER COMPANY, DES MOINES, IOWA, AND THE APPEARANCE OF THE FINISHED FRONT OF THE BUILDING. THIS METHOD OF CONSTRUCTION IS NOW CONSIDERABLY USED. THE MECHANISM IS SO LOCATED THAT THE WALL WHEN RAISED WILL COME INTO EXACT POSITION ON THE FOUNDATION, THE CORNERS BEING AFTERWARDS JOINED BY A CEMENT CORNER COLUMN MOLDED IN POSITION.



The Jewett Lumber Company, Des Moines, Ia., has so far as known the only solid cement shed. Walls were made flat on ground and then elevated into position by a system of screws. One of the walls, $4\frac{1}{2}$ inches thick, weighed 90 tons. Not only are the walls cement, but the posts, 8x8 inches, the girders, 8x12, the floor of the office, 24x28, and the hardware room, 22x40, are of the same material. Cement warehouse, 22x50 feet, has a 5-inch floor, supported by heavy cement columns, and is supposed to be able to support any weight that may be placed on it; 3 decks, the piles of lumber resting on independent foundations; capacity, 600,000 feet; 1,000 barrels of cement used in its construction, and its cost was \$10,000. The upper view shows appearance of finished shed front, and lower the method of erecting after molding in a level position.



and lumber unloaded from cars through side doors, $2\frac{1}{3}$ x6 feet; bins, 14-foot centers; rear of shed a half octagon, 34x58 feet, through which team may be driven from one alley to the other; wareroom, 28x34 feet; dry room 28x34 feet; room for mill work ready to deliver, 14x17; molding room, 14x17; foundation, cement piers; office separate building, 16x36 feet.



The Crane-Johnson Company's shed at Cooperstown, N. D., is 98x115 feet; 14-foot sides; 40 feet to crown; alleys $23\frac{1}{2}$ feet wide and planked with elm; piling space between alleys 34 feet, on the sides 17 feet; on sides, single decks; spur tracks on each side of shed



By the small dealer the Queal shed, at Yankton, S. D., would be called a "monster." It is 110x150, the outside walls 14 feet, and the height to the crown, 22 feet. The frame is of 2x6 tamarack. The alleys are each 22 feet wide and planked. The illustration shows the hipped side roofs.



THE BIG SHED OF J. H. QUEAL & CO. AT YANKTON, S. D.



CROSS & JOHNSON'S BIG SHED AT MINDEN, NEB.



D. E. BAKER'S SHED AT TRAEER, IOWA.



OFFICE AND SHED OF THE CLINT HAMILTON LUMBER COMPANY, MCCOOK, NEB.

Cross & Johnson, Minden, Neb., have a shed 58x140 feet; 35 feet to the crown; alley 22 feet wide, planked with 2-inch fir; tried cinders, treating them with oil and salt, but Manager Trumbull gives plank the preference.



D. E. Baker's shed (Traer, Iowa), is 101x120 feet; highest point in front, 38 feet; two alleys, 18 feet each, with 28-foot piling space between them, and 18 feet on the sides; roof, gravel, with a slant that permits the water to run off the rear end; front pressed brick and window caps and ledges of stone; for piers and walls 125 perches of stone were used; timber for frame built up, there being nothing larger than 2x8; easy capacity, 1,000,000 feet; cost shed and ground, \$14,000.

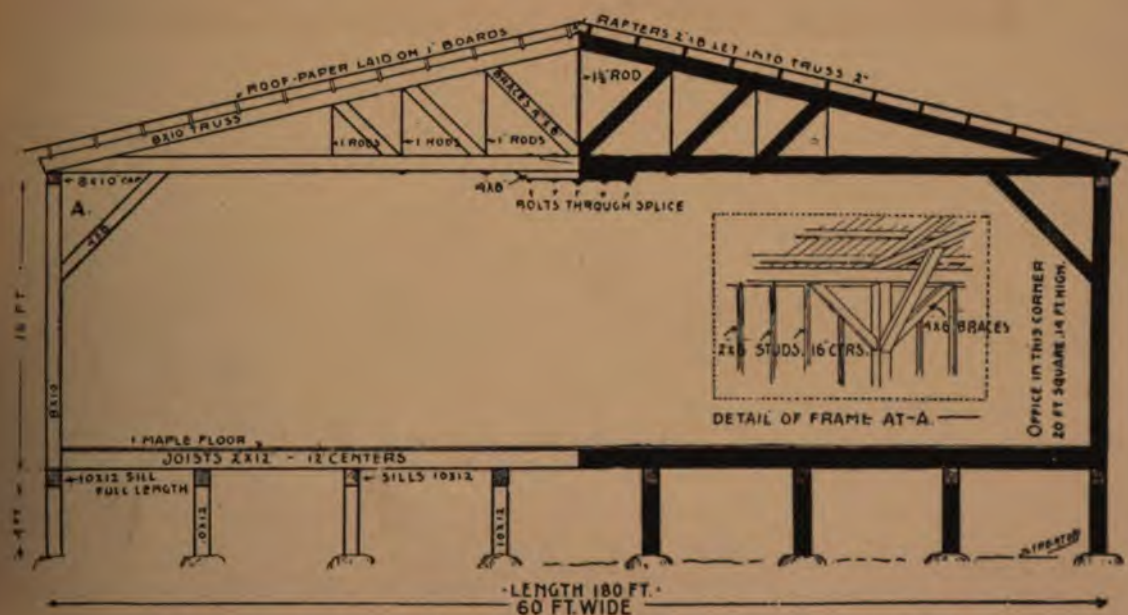


This plant of the Clint Hamilton Lumber Company, McCook, Neb., is one that presents a fine appearance. The shed has nine solid cement walls running lengthwise, and is 36x100 feet. The office, 18x36 feet, is of cement brick that was made by the company.

In the shed of W. J. T. Saint, Sharpsburg, Pa. (elevation plan shown herewith), the roof is self supporting, with not a post in the way; building stands four feet from ground; used for finishing lumber and sash and doors; smaller structures, if free space is required, could of course be framed in a like way; originally used for a skating rink.



The shed of the Reitsch Bros. Company, Rockford, Ill., is 62x154 feet, and the bins 18x20 feet deep respectively. The alley is 24 feet wide and planked.



PLAN SHOWING TRUSS ROOF CONSTRUCTION—W. J. T. SAINT, SHARPSBURG, PA.



MODERN PLANT OF THE BARR LUMBER COMPANY, AT HASTINGS, NEB.



SHED OF H. O. SHIFERT LUMBER COMPANY, AYOCA, IOWA.



SHED OF BOHRER LUMBER COMPANY, LINCOLN, NEB.

The shed of Barr Lumber Company, Hastings, Neb., is a pole shed (shown beyond the office in the engraving); open sides; center bins, double deck; side bins, single.



H. O. Seiffert Lumber Company, Avoca, Iowa, have a shed 94x116 feet; alley, 30 feet; inside posts, 8x8, 16 feet long, supported on brick and stone piers; lower bins, 12 feet high, 12 foot centers; on one side bins 16 feet deep, on other, piling space, 32 feet; weight in lower bins taken from frame; frame, excepting posts, hemlock; wareroom, 16x116 feet; front, pressed brick; side ventilation, through doors; probably no such sheds as these two in Avoca can be seen elsewhere in a town of 2,000 population.



In planning these sheds and yards it was the intention of the Rogers Lumber Company, at Lincoln, Neb., to have a plant in which lumber could be handled at a minimum expense. There are two double sheds, each 40x300 feet, mostly single deck, and a single deck, 20x300 feet. A defect in the original construction of the sheds was too narrow hoods, and these were to be made wider.



The shed of the C. Hafer Lumber Company, Council Bluffs, Iowa, was built to accommodate the lay of the ground. It has three stories,

is 72x163 feet and has a capacity of 2,000,000 feet of lumber. The rear street is on a level with the second story. The stock room is on the second floor in front, and back of this the shed has open sides with lattice work for protection. In the construction of the shed 175,000 feet of lumber was used.



As a curiosity the shed built by E. C. Abernethy, Joplin, Mo., is in a class by itself, it being under the grand stand of a base ball ground, and semicircular in form. The shed is 130 feet long, has a 9-foot hood and will accommodate 200,000 feet of lumber.



Illustrated herewith are the sheds of the Northern Lumber Company, Estherville, Iowa; 60x128 feet; alley, 20 feet, planked with 2-inch oak, frame, 2x4, on cement foundation.





SHED OF STEINMAN LUMBER COMPANY, MILWAUKEE, WIS.



SHED OF HAWKEYE LUMBER COMPANY, OSKALOOSA, IA.



C. L. COLMAN SHED AT LUVERNE, MINN.



LUMBER YARD OF RICE, JOHNTZ & NICOLAY LUMBER COMPANY AT ABILENE, KAN.

This shed of the Steinman Lumber Company, Milwaukee, Wis., is 112x120 feet; 2 alleys, 18 feet each, planked with 2-inch maple; foundations for piles and independent of frame; one side single decked, the center double; office, 16x30; 2 signs, each 120 feet, the letters 4 feet high.



Hawkeye Lumber Company's shed at Oskaloosa, Iowa, is 70x120 feet; alley, 22 feet, planked with 2-inch hemlock.



The shed of the C. L. Colman Lumber Company, Luverne, Minn., is 60x154 feet; three decks; alley, 24 feet; solid wall foundations.



Clark & Fellows, Grinnell, Iowa, have a shed with three decks, under lower one subbasement for timber; 50 feet to crown; main posts 8x8 inches; capacity, 1,000,000 feet.



The yard laid out in the form of a hollow square, the sheds surrounding it, is highly regarded by many lumbermen. The square of the yard of the Rice, Johntz & Nicolay Lumber Company, Abilene, Kan., herewith illustrated, is of unusual size, but it represents the plan. It has been said by fire insurance authorities that no other arrangement is so safe a fire risk, as ordinarily if an internal fire should break out it would be extinguished

before any great portion of the stock would be involved. In yards of this class the surrounding sheds are of the single type, single or double deck, as it may suit the taste of the builder. In a few yards the center is occupied by double open sheds, or "umbrella" sheds as very properly they are termed in the south; but generally this space, with the exception of the portion of it that is required for driveways, is used for piling shingles, posts and lath, and not infrequently timbers.



The shed of the Northern Lumber Company, New Hampton, Iowa, has three decks; is 56x128 feet wide, 20-foot alley; sash and door room, 2,260 feet.



William Miller & Sons, Rochester, Pa., have the type of shed seen in western Pennsylvania; no cupola or other provision for ventilation, except alley doors; spur track running into shed.





OFFICE AND SHED OF A. H. WALLACE & SON, WASHINGTON, IOWA.



POTLATCH LUMBER COMPANY, THORNTON, WASH.



SPRINGSTON LUMBER COMPANY, COLFAX, WASH.



OFFICE AND SHED OF JOHN HALLOREN, OTTAWA, KAN.

The shed of A. H. Wallace & Son, Washington, Iowa, is 57x264 feet; 3 decks; ventilation through doors which open on the side.



The Potlatch Lumber Company, Thornton, Wash., has a shed of the type of several seen in the wheat country of eastern Washington; barrels on top of the building filled with water, a protection against fire oftentimes seen in that section.



This shed, built by the Springston Lumber Company, Colfax, Wash., is an excellent type, the structure being continuous, with the office in the street end. Several sheds of this kind were seen in the great wheat fields of eastern Washington. This shed is 34x120 feet, and it will be seen that even the stairs leading to the platform were not omitted, which would make a more complete shed could this also be said about a guard rail.



The office and shed of John Halloren, Ottawa, Kan., are of brick, the architectural style and the profusion of signs attracting attention.



Bigelow & Donovan, New Hampton, Iowa, have one of the first inclosed sheds built in this section; 56x100 feet; alley 20 feet; entire upper portion of shed sash and door ware room. Formerly an incline track ran to a rear door of the ware room, but was abandoned.



The Haight Lumber & Machinery Company, Mandan, N. D., have a shed 65x135 feet; alley 30 feet; cost of shed, \$2,400.



The danger of wind, combined with a crown sign, may be seen from this illustration. The shed was 20x305 feet, and the sign was 6 feet 4 inches wide, extending the entire length of the building. It was not a tornado that did the damage, no other injury being done in the neighborhood—but simply a good, lusty wind. It emphasizes the fact that a single shed should not have too much of a wind catcher in the shape of a sign. This shed was in the yard of the Wausau Lumber Company, North Milwaukee, Wis. A sign of wire netting would have been a good investment in this case—before the wind came along.



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Names of Firms and Individuals From Whom the Plans and Suggestions Have Been Secured

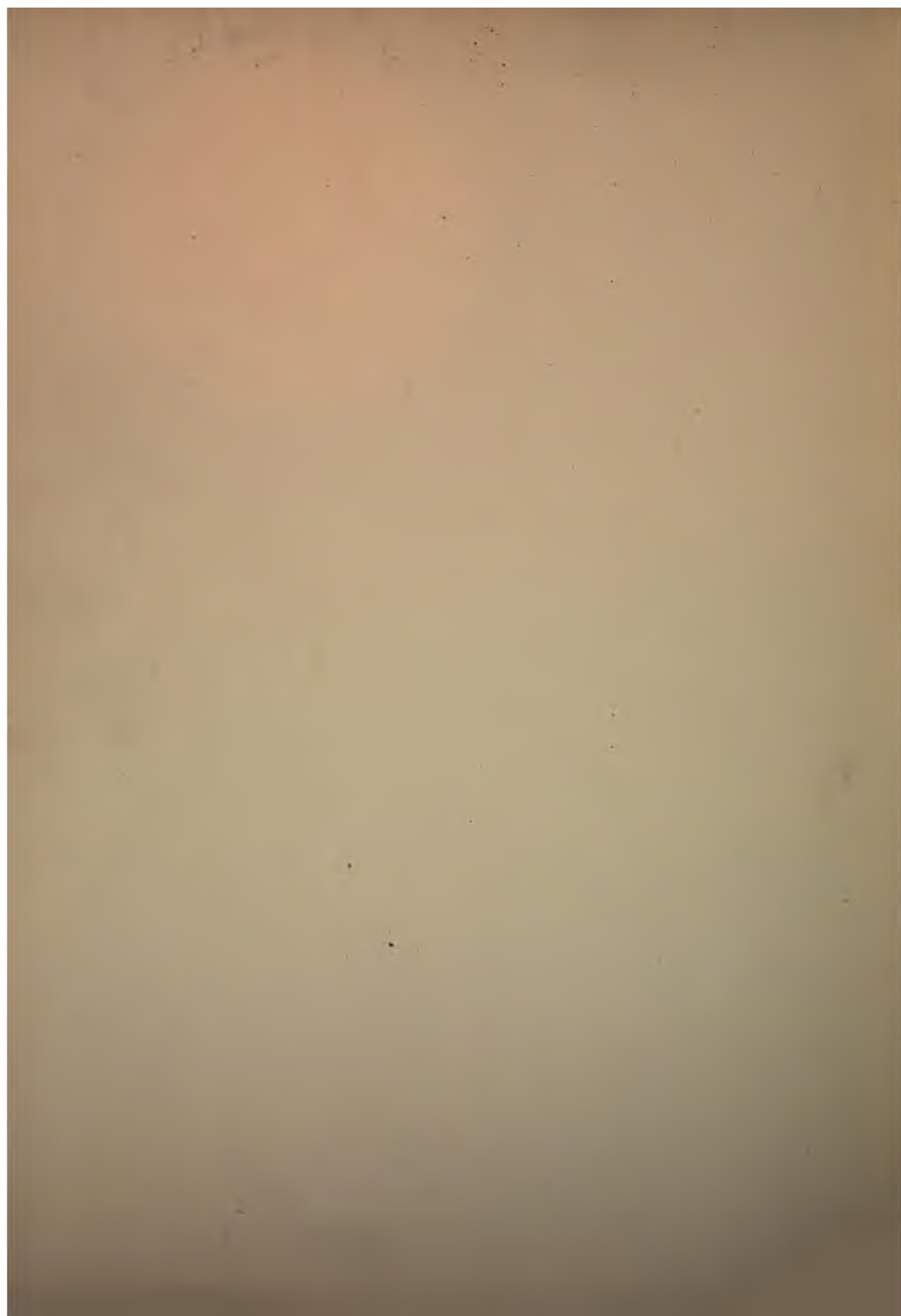
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